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New Commodore 64 is launched

- **Commodore launches the successor to the C64**
- **Graphic O/S could be bundled**
- **UK launch expected soon. Full details below and inside**

AS predicted in *Popular Computing Weekly*, Commodore has launched its enhanced version of the 64 the 64C in the US at least the machine has been restyled to resemble the Commodore 128 and incorporates a graphics environment, Geos which besides providing a Mac-like operating system also speeds up disc access

The machine's software suite consists of Geos word processing paint and communications software along with a desktop suite that includes notepad, calendar, alarm and calculator These may be bundled with the machine but Commodore UK acting general manager Chris Kaday wouldn t confirm this It s on sale now in the States where Commodore is billing it as the first point and click icon driven system available as low as $250

Commodore UK is expected to launch the machine in the next few weeks although Kaday won t confirm actual dates 'It will be launched in this country' he affirmed but added that he didn t want to give dates until units arrived He confirmed however that the new machine would replace the 64, and although he wouldn t talk about pricing it will clearly have to fall into the 64 s price bracket

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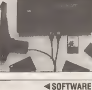
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- *Row over Amstrad's US sales claims*
- *All the news from CES in Chicago*

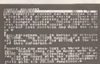
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ABC

How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles and any accompanying programs should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here – so please do not be tempted. We cannot guarantee to return your programs – so please do not send your only copy. **Accuracy** *Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

Amstrad's PC is delayed again

THE stop-go launch of Amstrad s IBM PC compatible machine seems to have been delayed again The company had considered both the Amstrad show, beginning this Friday, and the PC User show n July as venues for the launch, but technical problems have delayed the machine s dedut again

Current thinking is that Amstrad will launch the machine in July or August, rather than at an Exhibition However the machine should still become available in September as expected

The initial machines are intended to use Digital Research s Gem graphics environment running under the Dos Plus operating system but although DR isn t talking abut the software industry sources suggest that the company has had trouble compressing Gem down sufficiently so that it will work adequately on a 128K single drive machine The full-sized Gem more usually runs on machines with 256K and twin drives while on graphics-hungry machines like the Olivetti M24 it takes as much as 384K

It s therefore possible that Amstrad will take the same route as Atari which – eventually – put its TOS system on Rom on the ST series TOS is basically Gemdos DR s 68000 graphic operating system and although the company habitually denies suggestions that it is attempting to break into the IBM PC operating system market the combination of Gem and Dos Plus on the Amstrad PC is probably an attempt to do just that

Amstrad s decision to go for a DR operating system rather than Microsoft s MSDOS will reawaken old rivalries DR was built on the back of CP/M the Z80-based operating system that dominated the market prior to the launch of the IBM PC When IBM moved into the micro market however it shocked the industry by choosing MSDOS, produced by Microsoft which was then a fairly small company

The decision moved Microsoft straight into the big league, and ever since a counter-attack from DR has been predicted This may be it but DR won t be able to rest on its laurels as sources close to Amstrad suggest Microsoft is still in negotiation with Amstrad

A spokesman for Microsoft refused to comment on this but it is possible that Amstrad is considering implementing MSDOS and/or Microsoft Windows (Microsoft s own graphics environment) on later models of the PC This would allow Amstrad to play DR and Microsoft off against one another

Sugar: PC is postponed

Windows, however, is a non starter as far as the floppy disc versions of the machine are concerned, because it requires a hard disc Amstrad will be producing a hard disc version of its PC but hasn't yet decided on the hard disc to use

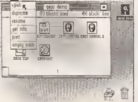
The company has, however taken out large quantities of *Wordstar* licenses from MicroPro at $1 (around 75 pence) a throw, and although Amstrad's exact production targets aren't known it appears to be anticipating sales of at least one million of the first generation of PCs

New 64 is launched

◄ continued from page 1

But he denied that the existence of a new breed of serious software for the machine raised questions about the future of the 128 This machine he said had been intended as an upgrade to the 64 not as a successor and would maintain this position within Commodore s range

The 128's extra features, however, have meant that *Commodore* has been unable to reduce its price sufficiently to compete with Amstrad in the home/small business market



The 64C & Geos O/S

The sale of the 64C alongside new applications software however, indicates that Commodore feels the serious home market can be attacked from the lower price bracket, and the machine's 64 software base will help give it a fighting chance against Amstrad in the Christmas market.

Conference to consider QL

A QL CONFERENCE for support companies who don t accept the machine is dead has been organised for the week after next The conference takes place on 23 June and is being run by *QL World* at the instigation of Colin Hughes of Transform

Some 45 companies have been invited Transform can be contacted on 01-858 6350

Unitsoft aid

MIDDLESEX mail order company Faculty Enterprises has a scheme to help anyone who lost money in the demise of Unitsoft (see *Popular Computing Weekly* May 29)

The company is drawing up a list of special offers and discounts which it will make available to those who are still awaiting for tapes ordered from Unitsoft.

For further details write (don t send money) to Michael Wright Faculty Enterprises 29 Rutland Court Ponders End Enfield, Middlesex (01-805 8054)

Peek and Poke

The Spectrum screen routine published in Peek & Poke May 22-28, has a minor hiccup in it which caused the machine to reset itself This is incidentally a pretty clever thing to do accidentally If you delete one of the two sizes in line 40 of the program the routine should work perfectly

Bust-up over sales of PCW

AMSTRAD has reacted angrily to suggestions published in MicroLink, part of Telecom Gold, that its US operation is in trouble. The report claimed that only some 40 000 PCW machines would be shipped to the US this year compared to an Amstrad estimate of 125 000 and that the company's Korean factory was only turning out 15 000 machines a month – around a third of Amstrad's claimed total.

"We've been shipping 10 000 machines a month to the States for the past three to four months," said a spokesman for Amstrad, "and we've currently received 75,000 irrevocable purchase commitments." Sears, the chain store stocking Amstrad in the US was still likely to take 125 000 machines by the end of the year while 320 000 PCWs had been manufactured so far with current production up to 50,000 a month. Amstrad's lawyers, he said were 'looking into' the MicroLink story.

MicroLink article has been sourced from *Informatics Daily Bulletin* but according to *Informatics* editor David Bannister the bulletin's initial information had been inaccurate but this had been corrected as soon as it was drawn to his attention. As far as he was concerned his magazine had no legal problems with Amstrad.

MicroLink spokesman Mike Cowley said that an apology to Amstrad was being issued and that MicroLink now accepted that Amstrad had already shipped 35 000 units to the US and was shipping a further 10 000 a month to Sears; no money appears to have changed hands, and it's likely the matter has been settled without recourse to law.

"The Amstrad says 'sue' but the Spectrum says 'don't'"

Cartridge stocks are stabilising

SUPPLIES of Sinclair microdrive cartridges seem secure – for the time being at least. British Telecom which uses the devices in its QL based Merlin machine has stocks of around 15 000 and has reduced its asking price to what one dealer termed a reasonable level.

Sinclair itself is effectively stabilising the market further by offering its stock of 8 000 QL program cartridges for sale. A few of these are saleable as programs but most of the stock is liable to be reformatted as blank cartridges, with a trade value of around £1 a cartridge. The company is likely to accept a fairly low offer for the stock.

Ablex, manufacturer of the cartridges, is also reportedly in negotiation with Sinclair to buy the rights. If this deal goes through the company may resume production.

Threats of lawsuits leave Domark spitting

DOMARK is to change the name of its *Splitting Images* game after a slight contretemps with the producers of the TV series Spitting Image Productions.

"It's all rather a laugh really," said Domark's Dominic Wheatley. "The Spitting Image people have a TV show which I've never seen, and they're a great big company that could sit on a little company like us."

He doesn't accept that Spitting Image Productions has a case but just to be on the safe side has renamed the game *Split Personalities* and is repackaging the product. "The overwhelming reaction of the distributors is 'what creeps'," said Wheatley referring to Spitting Image Productions rather than Domark. "They parody everybody else, but as soon as you parody them you're in trouble."

He added that, as he hadn't seen the show, any parody was accidental.

He also denied that stunts of this sort were cheaper than advertising.

Mark Strachan and Dominic Wheatley consider their response to Spitting Image's complaint

Dealer hits out over World Cup Soccer

WORLD Cup Carnival, US Gold's official World Cup game went straight into the games charts at number one this week, but is continuing to annoy both dealers and customers. The game is an 'adaptation and enhancement' of Artic's *World Cup Soccer* and according to US Gold boss Geoff Brown distributors and dealers should be portraying it as such, but many customers seem to be buying it under the impression that it is a new game.

"A phenomenal number of people are coming back with it," said Steve Lovett, manager of Virgin's Bristol computer store. He estimates that around 25 per cent of people buying the game are bringing it back on the grounds that it's simply a repackaged version of *World Cup Soccer*.

He also claims to have compared notes with managers of other Virgin shops and out of ten branches not one admits to having been warned of the game's origins.

SID seriously sick

LONDON-BASED distributor Software International Distribution is in serious financial difficulties and was likely to go into receivership as *Popular Computing Weekly* went to press. SID managing director Paul Duffy, who only joined SID from Mirrorsoft at the beginning of last week, said that he had found 'serious discrepancies' in the books.

"Technically the company's insolvent," he said. He would be discussing the figures with the company's accountants but felt it likely that he would have to put it into liquidation.

Popular Computing Weekly ran a £5 off software promotion with SID during April. Most readers should have received software ordered under this offer by now but anyone who has not should write in giving their name, address and details of their order.

We will give them further information just as soon as it can be obtained.

Product News

Amstrad MicroPro

THE complete range of MicroPro applications software apart from the *Wordstar* family is now being sold for the Amstrad range of machines by Software Classics. The products involved are *CalcStar*, *ReportStar*, *SuperSort*, *DataStar* and *Infostar* with the first two retailing at £39.95, *SuperStar* and *DataStar* at £49.99 and *InfoStar* at £69.95.

The products were taken over by Software Classics recently after MicroPro decided to confine itself to word processing related packages. Prior to this they had been extensively bundled on budget business machines, including those from Sanyo and Kaypro.

CalcStar is a spreadsheet, while *SuperSort* is a sorting utility. *InfoStar* is a combination of *DataStar* which supports data entry, updating and retrieval, and *ReportStar* which allows you to produce reports based on *DataStar* information. Details from Software Classics, 2 Schoolbell Cloisters, Arbery Road, Bow, London E3 5DD (01-981 4224).

Trilogic converts Commodore output

TRILOGIC is now selling the I-Con range of RGBI to RGB convertors for the Commodore 128. The convertors allow the 128's display to be viewed in 80-column mode on most RGB monitors or TV/monitors effectively turning them into fully compatible C128 medium resolution RGBI colour monitors.

All 16 C128 colours can be selected, and there is a connection to the monitor for audio output. The convertors also allow switching between 40 and 80 column display. There are currently three types of convertor – I-Con 1, for the Ferguson Tx range, I-Con 2 for Hitachi and Granada Rental TVs with Scart Euro RGB connector and video input. Most other types can be made to order for the standard price of £23.95.

Details from Trilogic, 29 Holme Lane, Bradford BD4 0QA (0274 684289).

Ariola to sell 64 WP package

ARIOLASOFT is to release *Paperclip* with *Spellpack*, an enhanced version of the Commodore 64 word processing package from US company Batteries Included. The word processor supports an 80-column video display without extra hardware, has a search function and can handle block moves.

The *Spellpack* section is a spelling checker with a 15 000 word dictionary, and this can be extended should you wish to use specialised words. This is just as well, as the dictionary is in American English. The packages are sold together and cost £59.95.

Details from Ariolasoft, Long Acre, London EC2 (01-222 0833).

Melbourne makes Fist of C16

MELBOURNE HOUSE is to release its hit game *Way of the Exploding Fist* in C16 and MSX formats. The game features two large graphic characters fighting a tournament against a colourful oriental background, accompanied by grunt and groan sound effects.

Details from Melbourne House, 60 High Street, Hampton Wick, Kingston-upon-Thames, Surrey KT1 4DB (01-943 3911).

Diary Dates

JUNE

10-12 June
Comdex International in Europe
Nice, France
Details: Business exhibition covering computers, printers, peripherals and software
Trade only
Organiser: Interface Group, 01-734 7282

13-15 June
The Amstrad Computer Show
Novotel, London
Details: Hardware, software and peripherals for Amstrad micros
Price: £3 adults, £2 children, £1 discount for advance sales
Organiser: Database Publications, 061-456 8383

24-26 June
Computer '86
G-Mex Exhibition Centre, Manchester
Details: Business and industry computer show formerly known as the Northern Computer Show
Price: Free entry by business registration
Organiser: Reed Exhibitions, 01-643 8040

28 June
Bracknell Computer Show
Coopers Hill Community Centre, Bracknell, Berks.
Details: Software and hardware for the Dragon, Commodore C16, Plus 4 and Vic 20
Price: £1 adults, children and OAPs 50p
Organiser: John Penn, 04203 5920

JULY

16-18 July
PC User Show
Olympia, London
Details: Hardware and software for IBM machines and their compatibles.
Organiser: EMAP, 01-608 1161

24-27 July
Acorn User Exhibition
Barbican Centre, London
Details: Hardware, software and peripherals for the Electron, BBC micro and Master machines. Trade only 10am-1pm on 24 July
Price: £3 adults, £2 children, £1 discount for advance sales.
Organiser: Editionscheme, 01-340 4557

SEPTEMBER

3-7 September
Personal Computer World Show
Olympia, London
Details: Software and hardware for home, educational and business computer users. For the first time this year the show is to be organised in three separate halls – business, games and education.
Price: £2.
Organiser: Montbuild, 01-487 5831

8th September
Official Commodore Computer Show
UMIST, Manchester
Details: A wide range of Commodore hardware, software and peripherals. Formerly the Commodore Horizons show
Price: £3 adults, £2 children, £1 discount for advance booking
Organiser: Database Publications, 061-456 8383

26-28 September
Electron and BBC Micro User Show
UMIST, Manchester
Details: Software, hardware and peripherals for the Electron, BBC micro and Master machines. Produced by Acorn
Price: £3 adults, £2 children, £1 discount for advance booking.
Organiser: Database Publications, 061-456 8383

OCTOBER

30-31 October
Hampshire Computer Fair
Guildhall, Southampton
Details: Business computers and communications
Price: Free entry by business registration.
Organiser: Testwood Exhibitions, 0703 31557

NOVEMBER

22 November
The 6809 Christmas Show
Royal Horticultural Hall, Westminster, London
Details: Dragon software and peripherals
Price:
Organiser: Microdeal, 0726 6820

Prices, dates and venues of shows can vary and you are therefore strongly advised to check with the show organiser before attending. *Popular Computing Weekly* cannot accept responsibility for any alterations to show arrangements made by the organiser.

Games go down big in Chicago

LAST WEEK S CES (Consumer Electronics Show) in Chicago saw the return of the games console with a vengeance From football pitch sized stands Japanese newcomer Nintendo and old stager Sega vied with one another while Atari which two years ago was living – barely – proof that the video games market was dead predicted it would sell two million consoles this year

Tramiel Two million games consoles to sell

News of the return of the consumer games market has been brewing since Nintendo s wildly successful test marketing in New York and Los Angeles commenced last November Atari was one of the first companies to cotton on to the market opportunities in this area, partially because the company had been quietly selling its own games machine since Tramiel took over and found this unglamorous volume business a good deal more lucrative than the ST

The latter is generating conflicting reports in the US but suggestions that the Amiga is matching or even outselling it are at least plausible so it s still some way from breakthrough

The Nintendo and Sega consoles sell at the $150 mark with games retailing at $25 Both have a wealth of bells and whistles with the Sega machine using both cartridge and credit card software The credit card version can handle games up to 256 K long while the cartridge variant takes a cool 1048K

The US software market, which hasn t had a lot to write either home or to its bank manager about recently has gone crazy about Nintendo, and should be reassigning some of the production capacity it has in the 16-bit market this way The folly of its early commitment to the new generation the ST and Amiga is illustrated by the companies shamefaced trickle back to the 8-bit standard Several companies have noted the British success here which has been based on addressing the large numbers of users of 8-bit machines still around in the States

British companies in Chicago were naturally concerned about the prospect of traffic starting to move into rather than out of Britain again Nintendo intends to open up shop here in 1987 and if it sweeps all before it in the US the British software houses will be forced to write for the machine Geoff Heath of Melbourne House was particularly apprehensive, pointing out that the lead time on cartridge and credit card software was much longer than on disc or tape, and that it is therefore difficult to control stock levels

On top of this non-programmable machines can t generate the freelance programming talent that s come from the likes of the 64 and Spectrum Herbie Wright of Firebird was however more sanguine about the video games threat. Nintendo he said was showing considerable arrogance in its attitude to Europe assuming it was the 51st state of America If it does succeed here it will be because of the combination of Japanese technology and American bullshit which together is unbeatable But he doesn t expect it to and Firebird won t be stampeding into cartridges

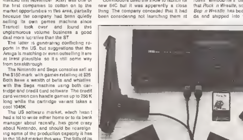
Commodore used the show to launch its new 64C but it was apparently a close thing The company conceded that it had been considering not launching them at all, and had been trying to offload its suite in the period immediately prior to the show The company pleaded fiscal responsibility pointing out (admitting?) that the new product wasn t the crowd puller it had had in the Amiga, but thoughts of the headlines that absence would have generated probably influenced its decision to turn up

In the event the serious side of the 64C proved to be one of the more interesting points of the show The Geos operating system as the company says provides the first mass market mouse driven system under $250 and the 64 itself has a wealth of serious software already available The company has also been talking about getting involved in communications, and is working with Lucasfilms on an unspecified project

Also on the hardware side Atari was predicting ST sales of 500 000 this year while Alan Sugar and Malcolm Miller of Amstrad were present prompting speculation about more deals with Sears over the Amstrad PC This may however be a little premature as visitors reported little demand for Amstrad CP/M software as yet. This indicates that sales of the 8512 have yet to take off there and that it will be some while before the machine s US performance can be evaluated

Sir Clive Sinclair s presence at the show was less easy to account for Apparently he goes every year but he looked suspiciously cheerful

The British software companies had a particularly good show with *Elite* toping the charts and this *Rock n Wrestle* and System 3 all winning awards But all isn t roses Melbourne s Geoff Heath reports that *Rock n Wrestle*, sold in the States as *Bop n Wrestle* has been pirated in Canada and shipped into the States



Sega's games console plus accessories

Letters

Star Letter

Mail order musings

The demise of Unitsoft (*Popular Computing Weekly* May 29) will have shocked many but surprised few There are simply too many companies trying to attract too few customers

In 1982 when the home computer boom was just starting and the Spectrum was a new product there was just one company selling software at discount prices – Megasave

It was convenient to buy software by mail order because you could get what you wanted and save a couple of pounds at the same time – for me the nearest computer shop was 20 miles away

A short while later another company emerged called Goodbyte with prices 25% below the shops For a time both these companies made money by cashing in on a potentially enormous market

Then we had a flood of other companies They all offered 25% discounts and Megasave were forced to offer 25% as well

Competition became fierce Companies began to offer software that was not yet available For example most of these companies were offering Elite s *International Basketball* just before Christmas Earlier this year the game was abandoned

I have lost money as a result of the collapse of Unitsoft Not much and I know many stand to lose a lot more I have bought 10-15 games through mail order companies and have had both good and bad experiences

But I have saved a lot more than I have lost through Unitsoft I personally will continue to buy software on mail order – at least while many shops continue to offer such a small selection

John Sheering
Godstone
Surrey

A year's supply of *Popular* binders will be whizzing off to John Sheering

Rolls Royce

Recently my Spectrum Plus keyboard died and after reading an article by Chris Jenkins in one of my back numbers of *Popular* where he praised the Saga Elite 3 keyboard I decided to get one

I phoned them up on Thursday May 16 and was informed that they were waiting for the keyboards to come in and that it would be sent the next week

On Thursday May 23 it had not arrived so I phoned again and was informed that it was in despatch to go out that night I explained my predicament and asked could they please send it first class and I would pay the extra They said they would and they did!

It arrived on Saturday by first class letter post and they did not charge me any extra It works like a dream It's like the difference between a C5 and a Rolls Royce Saga also sent me its new word processor program *The Last Word* at no extra charge

It s so nice to get such good service and such good quality goods that I felt that I must inform your readers

James A Tallett
Fort Augustus
Inverness-shire

Religious affairs

Just a few lines to state how intrigued I was on reading the May 29 issue to discover that the religion of Britain is Hindu!

This fact was gleaned from reading John Cook s review of *TRIM* for the Atari ST or more particularly, the accompanying illustration.

What's the matter John? Forgot to set the field – sorry "variable' – for *Religion* long enough? Or has something happened that I missed – the Royal Family joining the Radna Krishna Temple?

D G W Griffith
Cheltenham

Over the rainbow

I ve had a number of letters regarding my Rainbow+ program asking if it will run on the Electron I managed to borrow one and the result is in the following

The following changes are required for the program to run successfully on the Electron These are because the key readings are not the same as on the BBC Also remember the program will get going faster if you set *Page= &1500* before chaining it

The checksum for this section is different so

```
3730IFchk1% - 26404 THEN 3750 REM
26904 IN BEEB VERSION
```

Note that volume of sales enables me to reduce the prices as follows cassette – £6 disc – £7 3" disc – £10

Cy Noble
323 North Circular Rd
London N13 5JH

Pascal – debate goes on

I would like to join the discussion on the Amstrad Pascal compilers Hi-Soft claims that it has the fastest and cheapest compiler on the market That might be so but as a user of Digital Research s *Pascal MT+* on my CPC 6128 may I point out the advantages of this product over *Pascal80*
Very professional package with two useful manuals
Recursive functions, variant records procedure/function parameter passing
User defined modules which can be linked when necessary
Overlaying feature Programs can be larger than the TPA
Many other useful features and utilities like mini-assembly insertion conformant arrays (though one dimensional at the moment) Romable code, interrupt procedures very powerful disassembler and debugger
Any ISO program can run without any major changes (most of the time without any changes)

So you pay an extra quid for all these choosing a Pascal compiler has a definite answer

L Pancuk
London W13

Puzzle

Puzzle No 212
Can you find the missing number in this series
3 9 27 – 243 729?
No prizes for answering 81 but what we would like to know is if this series were to be continued what would be the first value which contains all ten digits zero to nine at least once

For example the twenty-second number in the series is 31381059609 This is not the answer since it does not contain a single 2 4 or 7 It does not matter if the same digit appears in the number more than once

Solution to Puzzle 207
The book cost £4 37 An alternative answer of £2.02 is disallowed as the wording of the question implies the higher of the two values

If we include the crown there are eight denominations of coin currently in circulation – £1 50p 25p 20p 10p 5p 2p 1p The maximum value of all of the coins if there are three of each is £6 39 so the array T(639) is used to store the number of times that a given total is arrived at with all permutations

The program uses eight *For Next* loops (A to H) each of which ranges between zero and three Line 100 calculates the total sum for the permutation and the corresponding variable in the array is incremented by one Finally the array is checked to see which values are set at 186 In these cases the subscript value denotes the price required There are two such 202 and 437 but the former can be discounted

Winner of Puzzle No 207
The winner is Kevin Hebbard of Stoufhockenden Essex who will be receiving £10
Rules
The closing date for Puzzle No 212 is July 8


DO YOU WANT TO BE A HERO?
Biggles
The result of unique co-operation between three ace software developers and the Biggles film production company, Biggles – The Untold Story will knock you right out of the air! It's a multi-part arcade strategy game in which each part must be completed to reach your final goal.
In the air, on the rooftops, on the ground, or in the trenches
YOU CAN BE A HERO!
Coming in May
Commodore 64 £9.95 tape, £12.95 disk
Spectrum 48K £9.95 tape
Coming in June
Amstrad CPC £9.95 tape, £14.95 disk
MIRRORSOFT
Purnell Book Centre, Paulton, Bristol BS18 5LQ

High standards

Ask BBC owners about Rom software and they will doubtless wax lyrical Similarly flick through any BBC specific magazine and you will find page after page of Rom software adverts – there must be something in it

Amstrad recognised that potential of Roms when it designed the CPC range but felt it would probably only control peripherals disc drives RS232 boards etc so no internal sockets were provided This also had the benefit of stopping people trying to open up the works

As a result publishers of Rom software had an uphill struggle – people had to buy an expansion board before they could think about software and early models cost as much as £50! To see this new, colourfully named Rombo board on sale at a much more reasonable £29 95 is an extremely welcome development

I must confess I am a committed zealot – Rom software is invaluable Obvious advantages are that the software is instantly available and that the whole of Ram is left free for data An added benefit is that nobody goes to the effort of Romming a piece of duff software and standards are high

The Rombo board is not only cheap, it's very well designed In order to fit every CPC (with its notorious moving expansion bus) the board connects to the computer by a ribbon connector This also means that the board in its sturdy box can be placed to the side out of the way on either side of the monitor

Without naming names some other boards that have tried the same thing have had teething troubles (they haven't worked) because for some totally incomprehensible technical reason the CPC's can't handle long cable distances

The biggest problem seems to occur with the DD1 disc drive and Rombo gets round this by having a through bus next to the computer where the ribbon leaves However as an added luxury there is a *second* expansion bus on the Rom board itself for less fussy add-ons Regular readers may remember me gnashing my teeth at some light pens that provided no through bus for disc owners the Rombo board has provided the perfect solution

A second non-standard bus comes off the box which the company have used for developing and testing Rom software in a sideways Ram chip A blurry circuit diagram for this is supplied or it will be sold for £19 99 It can also be used for a ZIF (Zero Insertion Force) socket, invaluable if for some reason you have more than eight Roms and need to change some around frequently

The Amstrad 464 only supports Rom numbers 0-7 with 0 being used for Basic and 7 for the disc interface Other peripherals may use some of the intermediates limiting your options The 664 and 6128 machines can support hundreds of the things so the Rombo board can be switched to act as numbers 8 15 if you wish

Each individual Rom can be turned on or off by a series of small switches – a vast improvement over some boards that use little plastic links not always supplied with the Roms and very easy to lose Unfortunately they are numbered 1 to 8 but confusingly correspond to either 0 to 7 or 8 to 15 The manual does warn you but it is easy to overlook With that one exception the documentation is brief but a model of clarity Essential information is large, and presented more than once

The developer of this Rom board Marcus Sharp has made the claim that this is a ' well made functional board at a reasonable price ' and there is nothing I could say that would argue with that A Midi interface and video digitiser are promised soon If they are of the same standard they will be very welcome

Tony Kendle

Product *Rombo 8 Rom Board* **Micro** Any Amstrad CPC **Price** £29 95 + £1 p&p **Supplier** M Sharp, 62 Meadowbank, Ladywell, Livingston, West Lothian EH54 6EL.

Easy mailing with Mailist

Mail List is a small but powerful program designed for those who wish to use mail merge facilities on their word processor (sit down everyone with *Locoscript*) but who don t want to invest the money and time it would take to buy and learn a fully fledged database

The presentation of the program is superb small virtuoso touches used in the screen display put more expensive programs to shame Each record can have up to 18 lines or fields and most of these come supplied with already suggested definitions Maximum use is made of default values and all you have to do is overtype the things you want to change

Once defined the records can be sorted by a specified field and a subset can be saved in a new file depending on whether another specified field includes or excludes a given string, eg, if the town field = LONDON Unfortunately, it seems impossible to specify more complex criteria for sorting and searching, eg 'town = LONDON or town = BIRMINGHAM' would have been nice

Demo files are also given to show how you can use your list with wordprocessors such as *Newword* to not only control the letter s name and address but also which paragraphs are included in it and in fact the mailmerge options offered by the word processor mean that a sophisticated database is possibly irrelevant anyway

Mail List also includes its own label printing option which is easily the simplest system I have ever used A selection of common label sizes are displayed on screen together with an indication of how your data would look on them You can position the printing and change the printer pitch size on the display to decide exactly how you would like it to look and it prints out correctly Only single width labels are supported

Tony Kendle

Program *Mail List* **Micro** Amstrad PCW/8128 **Price** £24 95 **Supplier** Newstar Software 200 North Service Road, Brentwood, Essex

Spellchecking on Paperclip

Paperclip is one of the most powerful word-processing packages for the CBM 64 and 128 and it has now been enhanced by the addition of a spelling checker routine

The new feature is easy to use and ingenious although limited in speed by the failings of the Commodore DOS This is how it works after writing your document or loading it from disc, go into command mode by pressing *Ctrl* In answer to the command prompt you then press *Shift/y* This gives you access to the spellcheck routine

This 15 000-word dictionary can be supplemented by a user dictionary which can be programmed to recognise any unusual words The dictionary loads up – a process which takes almost a minute – then the spellcheck routine goes through your document searching for unrecognised words Anything found Bear in mind, though that no spelling checker in the world can distinguish mistakes from context – had you typed "beer" instead of "bear" it would not realise that a mistake had been made It is most useful for spotting where words have been run together without a space or cases of blatant mis-spelling

An excellent program which should be a boon to rotten spellers or writers of large documents **Chris Jenkins**

Program *Paperclip* with *Spellpack* **Micro** CBM 64, CBM 128 **Price** £69 95 **Supplier** Ariolasoft 68 Long Acre, London WC2E 9HJ

Microsoft spreadsheet

If there s one thing that Amstrad owners aren't going to go short of it is excellent quality spreadsheets

Multiplan is the latest big name program to reach the bargain basement and indeed is probably the best selling CP/M spreadsheet in recent years

Next to Digital Research *Multiplan* s author Microsoft is probably the most influential software company operating in the USA Perhaps the most important implication of the release of *Multiplan* is that it signals Mirrorsoft s recognition Amstrad s importance in the small business market

Other than that it is difficult to know what to say about *Multiplan* without descending into a precise discussion of the finer command features It doesn t have graphics built in like the *Cracker* but otherwise it does almost everything other sheets can do The manual is superb and it is probably the most attractive sheet available with the option to set up multiple bordered windows

Most important of all is the ability to link and pass information between various separate defined worksheets, making it the best choice for those who have large amounts of data to coordinate Passing data from one file to another is a nice compromise between a Ram based system (fast but limited) and a disc based storage file (large but very slow)

An audio cassette tutor for the program is also available from the distributors

Tony Kendle

Program *Multiplan* **Micro** Amstrad PCW/8128 **Price** £99 **Supplier** Newstar Software 200 North Service Road Brentwood Essex

Meet Max Porka

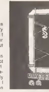
In a non-sexist world this would be called *Persontronix* but this is an imperfect world – a world in which criminals escape from interstellar hokey and hole up on the planet Zybor

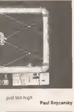
With Xtro II Ariel Head Mas Porka and Yokohama on the loose there's only one course for a bounty hunter like you It's into the jolly old spaceship and set course for their sanctuary This is a bring them back dead or don't bother coming back at all mission Luckily you have a Mantronix robot of your own to do the dirty work on the planet surface.

Zybor has obviously been modelled on a Californian open air modern art gallery The square paved ground is covered by contemporary sculpture shapes but don't touch the exhibits sir At their best they just get in the way but at worst they kill you

The Zyborians are a less than hospitable race too In fact all of them have a will to kill They also have different strategies ranging from the fairly dumb to the sneaky well I call waiting around then pouncing on your head sneaky, even if you don't Even your laser which appears to fire furry bolts is hard pressed to zap these out of existence

Mantronix is competently programmed in the Ultimate style There's a couple of nice little tunes and a clever loss of life effect, but what it lacks is variety and the pace is all wrong It's mildly addictive but not enough to get the adrenalin pumping hard The pack claims it's 'arcade adventure' which is pushing it and for such a simple shoot 'em up the price is just too high





Paul Svycarsky

Program *Mantronix* **Micro** Spectrum 48K **Price** £7 95 **Supplier** Probe Software, 155 Mitcham Rd, London



New Vroom sweeps

The news about the present QL seems a little garbled and not surprising confused However this has not deterred French software house Pyramide from launching a number of software packages

Vroom is an arcade classic (formerly called *Grand Prix*) where the player steers the car across a racing track while controlling the accelerator and the gears However the QL spin-off lacks the gear system

The player uses the left and right cursor keys for the directional control while the up and down keys are used for speed The objective of each game being to obtain enough points to enable you to qualify for another race on one of the other five different tracks It is a hard enough task trying to stay intact through one of the races as well as being able to maintain a high speed while avoiding other competing cars

The display is similar to *Grand Prix* with the horizontal picture being scrolled in accordance with the direction of the Formula 1 car, making the simulation fairly realistic

All in all the graphics are presentable and the game is very addictive and playable though you should be warned of personal high speed blow outs due to frustration

Mathew Palmer

Programme *Vroom* **Micro** QL **Price** £14 95 **Supplier** Pyramide, 28 Waverly Grove, London N3

Radio Activity

Never let it be said that Mastertronic doesn't know the meaning of the word topical' as its latest Amstrad release has you cleaning up the consequences of a nuclear power plant accident on an alien planet It's called *Rad-Zone*

Moving from screen to screen, via joystick or redefinable keys you must stabilise various radioactive objects and crystals while avoiding the mutated nasties There is the added element of ever increasing levels of radiation within your protective suit, shown by a gauge at the bottom of the display – the more radioactive objects on the screen the faster it rises

When it reaches critical your suit disintegrates leaving you to run about in your under garments frantically looking for an exit to a 'Safe Zone' This is any area you have previously decontaminated – on entering it your radiation level goes back to zero This element of building up a central core of safe areas adds a little strategic spice to the action – the surprising omission being the lack of a save routine

Throughout the graphics are well animated, the music excellent, and although I found the gamesplay a little less than 100% this is great value

John Cook

Program *Rad-Zone* **Micro** Amstrad **Price** £1 99 **Supplier** Mastertronic, 8-10 Paul St London EC2



Join the Rat race

The sand, the heat, the flies ... If only army tailoring was better. Here you are in khaki shorts and the North African campaign now looks even more daunting as *Desert Rats* appears in an expanded version.

This is one of the most comprehensive computer wargames I have seen, yet surprisingly it also uses a simple but clever control system with no hint of a grid. Having chosen a one or two player game (and which side the Spectrum will command) you give orders or receive reports on the units one by one.

Initial letters from a menu are all that's needed to dig in and hold or maybe go in for an assault.

Not only does the landscape affect your fighting prowess – but how long you have had to establish a position, morale and most importantly your state of supply.

Once orders are given the pieces move and combat is resolved all fairly speedily. The options range from a short seven turn beginners scenario in which the British try to clear the road to Tobruk, to the opportunity to play the whole campaign.

But no worry if you start at the beginning and you're doing so well that you feel like continuing.

That option is provided for with a save game routine, as is the possibility that over the 624 turns you and your human opponent may fall out or ill or one ofyou may go on holiday: you can then change from one to two player game and back again.

My major grumble is that you can only scroll the map while the computer is moving forces and resolving combat and it could be useful to get an overview at other times. But for the hardened wargamer this is a must.

John Minson

Program *Desert Rats* **Micro** Spectrum 128/48K **Price** £9.95 **Supplier** CCS Ltd, 14 Langton Way, London SE3 7TL

Fergus the Boggit man

Well it had to happen after the tremendous success of *Bored of the Rings* the Delta 4 team courtesy of CRL are about to amuse and confuse us once again with *The Boggit*.

I would think by now all adventurers have at some time tackled the immortal *Hobbit*, but rest assured this is no mere clone. Played strictly for laughs the game sets the right mood from the beginning, when Grandalf crashes through the window "tarzanian-like" and places a box of chocolates and a small card on your threadbare carpet before disappearing.

Fergus McNeil and Jennifer Childs have gone out of their way to include as much harmless mickey-taking as possible. Even the Trolls are not left out, bearing the unlikely names of Bernard and Matthew (does Fergus live in Norfolk?) they wander around muttering profound statements like "he would look lovely in my crispy batter".

The game cannot be anything else but a smash hit. It is a marvellous tour de farce guaranteed to bring a smile to Scrooge the Turkey Slayer's face. It also serves to remind us that adventuring is played for the enjoyment it brings, and when combined with nostalgia and good harmless fun definitely makes a good game.

My only disappointment was that the copy I played was a demo and only allowed me to get as far as the Goblin's cave. I would have loved to have seen what was in store for me in the Goblin's dungeon and, I feel certain, Gollom would have a surprise in store for me. Alas at the moment it is not to be, I, like you, can only wait for the general release of the game before I can continue to be thoroughly entertained by Bimbo and Co.

Roger Garrett

Program *The Boggit* **Micro** Spectrum 48K **Price** £7.95 **Supplier** CRL Group, 9 Kings Yard, Carpenter's Road, Stratford, London E15

Get your kicks

You probably think it's a doddle being a game reviewer. Well it isn't. It's damned difficult to think of new things to say about games that all look the same.

The game in question this week is *The Fifth Axis*, the latest from French publisher Loriciels running on the Amstrad.

You control the usual hero – brave, resourceful, taking on hundreds of robots with only flying fists and feet for weapons. There's the usual bit of nonsense about why you should be doing this – you know the sort of thing, Professor Chrono's time machine blowing up and threatening reality.

So you run about the laboratory, kicking the daylights out of the robot guardians, picking up artefacts. When you score 10 per cent, you get transported back in time to get a bit of the time machine. This involves running from left to right while unseen opponents chuck spears and bits of rock at you. If you succeed you get to go back and do another bit, presumably until you've done it all.

The animation of the hero and the robots is very well done, and there's a nice little jingle that plays in the background (until you inevitably turn it off). But the background graphics are rather dull and it all becomes rather wearisome after a while.

On the other hand, it will undoubtedly keep you amused for a while and it's all professionally competent. But could I make a heartfelt plea and ask programmers and software publishers to look up originality in their dictionaries.

Peter Worlock

Program *The Fifth Axis* **Micro** Amstrad 464/664/6128 **Price** £9.99 (cassette) £14.99 (disc) **Supplier** Activision, 23 Pond Street, London NW3

Hubble, bubble, toil and trouble

Mark Jenkins joins Sierra Software in the search for the Black Cauldron

An unlikely marriage between Mirrorsoft and Walt Disney (with Sierra Software acting as registrar) allows us to enter the wonderful world of *The Black Cauldron*, which first saw the light of day as a full-length animated cartoon in the cinema a few months ago

Running on the Atari 520ST and 1040ST, *The Black Cauldron* has the advantage of the ST s excellent graphics high-speed operation and massive memory capacity The presentation of the package is suitably plush – in addition to two program discs you ll find a map of Prydain the fictitious country in which the game is set a beautifully illustrated booklet with scenes from the cartoon film, illustrations, playing tips and a glossary, and a stack of advertising literature for other Sierra games such as the terrifying *Winnie The Pooh In The Hundred-Acre Wood*

The plot

The Black Cauldron opens at the cottage of Dallben wizard of Prydain and the hero Taran can be moved from this scene using the mouse, arrow keys or joystick The scenes are all animated with moving animals, water and so on and Taran moves from one scene to the next with a loading time of a few seconds for each scene There are 70 scenes altogether using 16-colour graphics and they re generally pretty detailed, with complex buildings woodland scenes and interiors

Hitting the right-hand mouse button calls up a small menu over the scene to allow you to select *Do Use*, *Look* or *Return* The possibilities of *Do* will depend on where you re standing at the time – if you re in front of a door it will open If you re in the pig sty you ll get to feed the pig, Hen Wen the other major character

In some cases you ll be able to pick up objects and delving around in Dallben's house gives you five points for picking up a knapsack water bottle rope and other essentials It also gives you the opportunity to see a psychic pig prophesying the future – the ability for which Hen Wen is being sought out by the evil horned king who wants the powerful black cauldron It's your job to get the pig to the fair people and destroy the horned king s plans



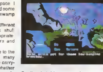
Game play

After you ve persuaded the pig to come along, the game moves at a fair pace I managed to pick up a magic lute and some other items and once drowned in a swamp after only two minutes

The way Taran responds to different surfaces is impressive – he walks shuffles swims (or drowns) as appropriate and passes behind trees boulders and other objects

At any time you can hit *Tab* to go to the status screen which shows how many points you have what items you're carrying (there are 30 to be found) and whether you want to continue or save the game to disc to carry on another hme As you get deeper into the game you ll find six arcade sequences and mazes with obstacles such as talking rocks to dodge and a selection of seven soundtrack pieces from the score of the film

On the whole this is an unusual and absorbing game it takes some time to get used to the fact that what you can do is largely pre-decided by where you re standing and what has gone before in the game – it s not like other adventures where you can type in eat the pig or other witty ideas when you re frustrated The graphics help to relieve any possible boredom though and there s a good cast of characters including Gurgi a furry dwarf who spends most of his time eating your food the beautiful Princess Eilonwy the horned king, and his dragon-like Gwythiants (which managed to eat my pig early in one round)



A lot of work has gone into *The Black Cauldron* and like the film it can only seriously be criticised for mangling the Welsh language (Fflewddur Fflam indeed!)

It s a fascinating combination of text, graphics and arcade action, making full use of the Atari's facilities including sound effects such as rushing water, jolly pieces of music and so on

You can use the game to re-enact the plot of the film or go out on your own to develop new adventures Both options are equally absorbing

Tips on playing

Look everywhere – some objects are hidden in not very well-labelled positions Pick up anything that isn t nailed down and remember to keep interacting with the characters looking after the pig feeding Gurgi and so on

Talk to anyone you meet (a few evil characters exist, though!) and keep a map on paper of your movements in case you need to re-trace your course Played this way *The Black Cauldron* should provide hours of entertainment

Mark Jenkios


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Bomb Jack pokes – and the Nexus competition

Tony Kendle casts an eye over a variety of releases – plus the chance to win the Nexus trophy

Before I get on with tips and pokes this week I would just like to give a quick mention to Domark's new release *Splitting Images*, shortly to become *Split Personalities* (see this week's News Desk)

Branded as the greatest licensing agreement that never was, Donmark's game is described as a "computerised jigsaw" It strikes a common chord with the well known TV series of similar name (pure coincidence of course) in that it features caricatures of well known public personalities

The objective is to assemble the pictures by sliding square parts around In play it is vaguely remeniscent of those slider puzzle type games that appear occasionally occasionally, *Jumbly* and *Confuzion* springing immediately to mind As a genre they tend either to turn you off or prove instantly addictive, but even if you fall into the former category please try to get a glimpse of the new game It is full of lunatic little touches that bring an old idea alive and the quality of the programming is superb The puzzle itself is complicated by opening chasms that can swallow pieces, unwanted parts of a picture (such as an atom bomb cloud with Ronald Reagan), and smart bombs that cost you a life unless you can get rid of them

The game is fast, furious and fun, with some excellent sound effects on the ordinary spectrum (there's a great whisking noise as you sling a bum piece away through one of the holes) My only criticism is that the pictures always seem to occur in a set order, making me despair of ever seeing the be-knighted Clive Sinclair or Alan Sugar Despite that, and despite a tendency to be cynical about the title, I rate it as easily the best brain game since Ariolasoft's *Think*!

Taking of Ariolasoft reminds me that I have just received a copy of *Archon 2 The Adept* Regular readers will remember that I approved of *Archon 1* in the past and I am greatly looking forward to seeing what the sequel has to offer (perhaps the monsters go on holiday) – expect a full report in due course

Phil Waknell, of Milton Mowbray has sent in an interesting little bug that he has found in the Spectrum *Ping Pong* First you must win a game on level 1 Then on all the following games simply hit the ball into the net on the FIRST point The crowd will cheer, you will be credited with the game and 255 000 points each time In this way it is possible to get a maximum score of 999,990 points Thanks Phil that's some bug

While on the subject of Imagine/Ocean despite the deserved acclaim from critics for the graphics and animation of *Green Beret* I find the game simply too difficult to get very far – pokes or tips anyone? Personally I greatly prefer *V* which has easily the most intricate background display of any Spectrum game and some great gameplay as well – with the exception of *Batman* it is the best thing Ocean has done for months Tips for the solution of this game, particulary concerning the blasted alien icons, will be very welcome

Old friends of the column the Langley hackers, have done Spectrum owners a great turn with this routine for getting into *Bomb Jack*

Type in and run this line, then start the tape

2 Merge "" Clear 29877 Load "" Code

Poke 65533,25 Poke 65534,19 Randomise Usr 65465

When the game has loaded it will crash (sic!) and you can then enter your pokes

Poke 49530 N N = No of lives
Poke 49984 0 Infinite lives

To start the game

Randomise Usr 49483

Possibly of less immediate value is this routine for infinite lives on *Cyberun* — but perhaps it will mean we will be able to work out why, despite all appearances, it really IS a great game when you get into it.

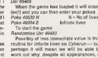
Run this and start the tape for infinite lives.

```
10 LOAD "" CODE RANDOMISE USR
24576 LOAD "" CODE POKE
23446 175 POKE 23447 50 POKE
23448 210 POKE 23449 244 POKE
23450, 195 POKE 23451 126 POKE
23452 92 RANDOMISE USR 23424
```

Another useful letter this time for BBC owners, comes from Iain Tetch of Chingford who says I know that you are frequently asking for more BBC owners to contribute so here I present an infinite lives poke for the BBC version of Elite's *Commando* Start as usual – *Chain "COMMANDO" Return* After the *Screen$* has loaded press *Escape* and enter *'Load TGAME Return* When this has loaded enter *?&23BB=0* then *Call &2300 Return*

'The start screen should now appear Make sure that you choose the correct combination of one and two player and keyboard/joystick controls as you will not have an opportunity to change them once the game has started

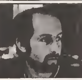
To round off this week a competition I'm sure many of you have seen *Nexus* by now – the espionage arcade/adventure by Nexus Productions in which you play the part of a journalist trying to locate your friend within the HQ of a drug baron



We're looking for the first person that can beat *Nexus* – without breaking into the program! To prove that, we'll need the answers to the 32 questions asked in the instructions plus the final instructions given by the computer after all the answers have been transmitted

The first person who sends all this in will receive a trophy from Nexus plus the promise of a complementary copy of the next Nexus game The next 10 correct entries will receive numbered certificates of merit plus the free game It's only on the Commodore at the moment but Amstrad and Spectrum versions are planned so 64 owners better make the most of their head start while they can!

Send entries to Nexus Competition Arcade Action 12-13 Little Newport St London WC2H 7PP

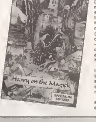


Down in the dungeons of Magick

Tony Bridge is at hand with help for Heavy on the Magick and Ring of Darkness

Andrew Hay has been taking time off from exam revision lately, and venturing into the gloomy dungeons beneath Collodon's pile in the fabulous *Heavy on the Magick*. This is everything that I was hoping for in PSS's *Swords and Sorcery* being a great slash 'n' hack as well as offering plenty of scope for character-building and advancement; look out, too, for the expansion modules which will give the game even more depth. Andrew has managed, on May 20th, to find two of the three exits.

"The most important object to have is the (9) on the first level, and to get this quickly you need to open a door by saying *(1),(12)*. The (9) is two rooms further on. It is used to enable you to invoke Astarot without being killed. Place it on the ground in a safe room, stand well clear. Invoke Astarot and then say *Astarot, place* where *place* is the name of the area to which you wish to teleport. This facility allows you to take the (10),(13), and (15) from their rooms, which is otherwise impossible. It



also makes the *Save* option virtually obsolete.

'Another handy item is the (3) on level two. It's behind a door opened by gold. The (3) is used to invoke Magot. Once summoned, you can ask him about objects that exist in the dungeon, and he will tell you the area in which they to be found. The following items are needed to kill certain monsters.

(10) – werewolf, (7) – vampire (pretty obvious!) (11) – slug (ditto!) (4) – cyclops (5) – medusa. The following also help in certain circumstances. The (6) to get across the chasm, the (2),(8) to get past the hydra and the (14), (8) to approach any fire.

All the rooms with a locked door and a table need some object to be dropped on the table. If there is a toll sign, the object should be a bag of gold, and if there is no sign, then one of the metal keys is required.'

Andrew also goes into some detail about various passwords needed for the exits, but I'll save this information for

ADVENTURE HELPLINE

Heavy on the Magick on Spectrum. What is Rabak's real name? And what is the great sign I in tree'? Miss M R Dale, 9 Bedford Street, Scarborough, N Yorks YO11 1DB

Pirate Adventure on Commodore Plus/4. I can't get past the crocodiles in the cave to get to the door. Help! Paul Henshaw, 274 Greenside Lane, Droylsden, Manchester M35 7BL.

Sherlock on Spectrum. How do you stop Lestrade arresting Floukes? Plus any other help. Keith Ellis, 448 Howlands, Welwyn Garden City, Hertfordshire AL7 4HP

Heavy on the Magick on Spectrum. What does the sign mean? How do I pass the slugs through the iron door? Ray Watson, 12 Helgent Mount, Ward Green, Barnsley, S Yorks S70 6BR

The Pawn on QL. How do I open the guru's cupboard, or get past the alchemists, or move the wheelbarrow? Rhys Clement-Evans, the Rookings, Out Lane, Woolton, Liverpool L25 8NN

The Hobbit on Spectrum. How do you get the ring? I seem to spend hours running around the dungeon trying to find it. OK CM Purvis, HMS Osprey, C13 Mess, Portland, Dorset

Castle of Terror on Commodore 64. Help me to kill the count! I think I have to break the spear – but how? Len Shuttleworth, 12 Richborough Close, Orpington, Kent BR5 3TQ

Ghost Town on C16/Plus/4. What is the code number which you ask for after you touch the bottle on screen 17? Chris, 100 Gossops Drive, Gossops Green, Crawley, Sussex RH11 8LD.

Pilgrim on Commodore 64. How do you open the cellar door? What do you do at the cliff? How do you cure radiation? Stuart Ronayne, 5 Tursyn Court, North Arbury, Cambridge CB4 2RN

The Hobbit on Spectrum. Has anyone got a map? Mark Strain, 91 Longmuirhead Road, Auchinloch, Kirkintilloch G66 5DJ

Gremlins on Spectrum. How do you get the gremlins into the vent system and how do you kill them? Mark Strain, 91 Longmuirhead Road, Auchinloch, Kirkintilloch G66 5DJ

Hampstead on Spectrum. I've got the screwdriver from the desk. What now? Mark Strain, 91 Longmuirhead Road, Auchinloch, Kirkintilloch G66 5DJ

Bored of the Rings on BBC B. I can't get past the black riders. Duncan Jones, 38 Long Reach Road, Cambridge CB4 2UG

Red Moon on Spectrum. How do I get past the dog, and how do I stop the monsters' ghosts from constantly appearing? David Edgar, 1 High Parksail, Erskine, Scotland, PA8 7HY

Lord of the Rings on Spectrum. I have reached Weathertop but I don't know what to do now. Please help. David Edgar, 1 High Parksail, Erskine, Scotland PA8 7HY

Hampstead on Commodore 64. I've visited Chubbie's mansion and been knighted – now what? Shelley Baron, 1A Wayside Avenue, Bushey Heath, Herts WD2 3SH (01-950 9520)

Kentilla on Spectrum. I can't get into Grako's Tower. How do I get into Tylon's Castle? Dean Clay, 42 Leggatts Way, Watford, Herts

The Pawn on Atari ST. How do I get past the dragon? Darren Ley, 5 Duree Road, Billericay, Essex

another time He also asks for help in opening the final exit, which lies behind a door, the clue to which is: "An eye for an eye to enter paradise" If anyone can help Andrew, or just wants some first hand help, write to him at 16a Trinity Street, Cambridge CB2 1TB

The words corresponding to the numbers used above are
1) door, 2) snake 3) sunflower 4) slet 5) mirror 6) sleep 7) garlic, 8) flask 9) sword 10) nugget; 11) pallet; 12) wolf; 13) egg, 14) salamander, 15) pellet.

Venerable vintage

Another role-playing game in which your character can be built up throughout the game is *Ring of Darkness* This is of venerable vintage and originally available on the Dragon though later converted for other machines It has now been given a new lease of life by Global Software and someone not a million miles from where I m sitting at the moment It is part of the Amstrad version of the *Fourmost* collection and has often been mentioned fondly in reader's letters Many columns ago, Marc Jones gave us some hints and it's a good time I feel, to pass more on to newcomers to this adventure

"My most successful character was an elf, which was important as the spells available are less likely to fail than those for a dwarf The only way really, to escape from the Dungeon is to take with you many *Up Ladder* spells and when your hit points get low, start casting – pronto! The monsters on the eighth and ninth levels are quite horrendous (I once lost 700 hit points in one go), so it is necessary to stock up with hit points before descending into the dungeons, which can become a little repetitive

The bandits and the evil rangers can become quite a problem and you'll need something faster than Shanks' pony, the hovercraft (!) being the best bet this also drastically cuts down on the amount of food consumed between towns As the game progresses, more efficient weapons can be stolen but save the game to tape first as the guards will rush in and deal out severe damage The best way of obtaining money outside the dungeons is to rescue the princess, although this might appear to be your ultimate goal, heavy hints from the Innkeeper will indicate otherwise

Plate is great

"The jester has the key and although contacts with him may lose you items, it can't be helped – first of all obtain/buy/steal a good weapon and armour (plate is great, deflections suit is brilliant) and then the jester must be herded toward the prison gates which can take a long while and become infuriating but its worth it Once the jester is outside the jail, kill him, take the key and open the cell immediately, the princess will attach herself to you Now the guards will rush in, and you may be killed, but you are resurrected again with 2000 hit points and 2000 gold pieces

"There are many dungeons each of them different, and you must wear armour all the time, but you must watch out for the jelly cubes which can dissolve armour (and bear in mind too, that some dungeon walls are false and ladder spells always fail beside these) Wizards incidentally have many potent spells available such as *Create Bars* and *Kill* Even after a year, I still enthuse over the game It has its faults, but the atmosphere when one has 10 hit points left from 1000 and has emerged from the 10th level to the first but is faced with a giant spider down a long corridor one *Up Ladder* spell to freedom

I agree that *Ring of Darkness* has its faults and it is certainly no match for something like *Heavy on the Magick* graphically at least but what drew me to it, and lead to my recommendation for the *Fourmost* collection was the way in which the character could be guided through the levels and with careful play could become a powerful entity ready to tackle anything in even the highest levels of the game There's plenty here for the role-playing enthusiast and is a good introduction to programs such as the *Ultima* series I look forward to seeing conversions of the follow-up, imaginatively called *Return of the Ring* which is reported to be even better

The original *Ring of Darkness*

Blow-by-blow

Help from the adventure companies themselves was started by Melbourne House with David Elkan's *Guide to Playing The Hobbit* (Melbourne House £3 95) which gave a concise blow-by-blow solution to that game Now a couple more the first is from Novagen whose *Targ Survival Kit* is now available for anyone stuck in the superb *Mercenary* The *Kit* (again £3 95 mail order a bit much I feel though the printing is very glossy and professional) includes identification charts of all the various craft in the game as well as maps and charts of the city and a novelette giving some important clues (and Novagen has told me that shortly to be released is a new set of data – to be loaded via the *Load Game* facility in the main game – which will take the player into *The Second City*, and a really tricky scenario I can't wait (and *Mercenary II* is even now under development)!

Exhaustive

And Century Communications has just released a guide to playing *The Fourth Protocol* written by the authors of the game, it's an exhaustive, 130-page breakdown of the adventure, and contains a multitude of help and advice, screen shots anecdotes In fact every possible detail you'll need to complete the game and the different versions for the Spectrum and Commodore are covered too Salient inputs must be decoded with the help of the "one-off" pads in the handbook. The price of £5 95 seems outrageously high and seems geared to make the book a minor seller but if you are looking for a deeper insight into the way that these adventures are written or even if you have completed the game and just want to find other ways of doing it, then I can recommend this for a good read

Novagen Software, 142 Alcester Road, Birmingham, B13 8HS

Century Communications Brookmount House, 62-65 Chandos Place, London WC2N 4NW

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Pascal propositions

Pascal is one of the three most widespread computer languages. In this, the second in our series on Alternatives to Basic, David Nutkins outlines some of its features

Why should you think about programming in Pascal if you've tried Basic? One reason is that interpreted Basic is slow. Sometimes this can be solved by using a Basic compiler as discussed in *Popular Computing Weekly* a fortnight ago. However Basic compilers tend to either have restrictions or else don't give you that much of a speed increase. But the real things that Basic doesn't have are full data and program structures.

By program structures I mean things like *For While*, *Repeat* and *Case* statements and user defined multi-line procedures and functions with parameters. These make writing large readable programs much easier and tend to be present in the best modern Basics. QL SuperBasic, although notoriously slow, is exceptionally good in this respect. These features are also present in languages like Comal and C.

However just about every version of Basic and Comal has the same restrictive data structuring facilities which really make Pascal and C stand out from Basic.

What do I mean by data structures? Most Basics have two fundamental types of data: numbers and strings. Simple variables, say *X*, can be used to store numeric values, either whole numbers or fractions. Strings, eg, *X$* can be used to store single characters or collections of them. The more modern Basics add integer variables, eg i%. The percentage sign indicates that the variable can store whole numbers, often between −32768 and +32767. This means that less memory is used and normally code using them runs faster.

Real beauty

There is one structuring method in Basic, the array. Any type can normally be grouped together to form a collection of objects. Arrays are declared by using *Dim* statements to tell the interpreter how many elements an array has. Elements of the array are then referred to by an index in brackets after the name, e.g. *Dim A$(15)* creates 15 strings called *A$(1)*, *A$(2)* ... A$(15). The real beauty of arrays is that you can use an expression as the index, thus giving you the ability to process different elements with one statement rather than just as a lot of separate statements.

In Pascal, however, there are the following simple types: integers, reals, chars and Booleans. Reals are like normal numeric variables in Basic. Chars are like strings with a length of one. Boolean variables can be either True or False. So if *B* is a boolean variable and *I* and *J* are integers you can write

```
b:= i>j
```

and then say *If b Then* something. If you don't like the types provided for you can make your own. For example, if you have an application that uses days of the week, you can say

```
TYPE day=(mon, tue, wed, thur, fri, sat, sun)
```

This is called an enumerated type. With this declaration you can declare *d* as a variable of type day and use, say, *For d = month To sun Do*. This makes programs much more readable so that you, or someone else, can look at your code in months or years time and be able to understand it, and thus modify it for their current needs.

Additionally, if a variable should only take on a weekday value you can define this to be *mon ... fri* thus making your program easier to understand and, if you are lucky, the computer will tell you if you try to make that day *sat* or *sun*.

Yearly profits

Pascal has four main methods of structuring data, the array, the record, the set and the file. Arrays work in a similar way to Basic but in addition the lower index bound doesn't have to be 1 and in fact can be a character or user enumerated type. So if you wanted to store the yearly profits of a company from 1950 to the year 1999 you can use

```
profits:ARRAY[1950 .. 1999] OF REAL
```

rather than subtracting 1949 off the year to make the index expression in the range of 1 to 50.

Arrays let you keep elements of the same type together but if, say, you want to keep track of dates on computer, you need to store different types together. The record type lets you do this. For example where *date* is defined as

```
date= RECORD
        day 1 .. 31
        month=(jan feb mar apr,
        may,jun,jul aug sep,oct,
        nov,dec)
```

Pascal special offer

Now you've read about Pascal, maybe you might want to use it – so *Popular Computing Weekly* has arranged a series of special offers so you can program in Pascal at a bargain price. Just fill in the coupon below, write a cheque or postal order payable to Sunshine Publications – and send it off to our usual address – 12-13 Little Newport St, London WC2. Please mark your envelope 'Special Pascal Offer'. Offer closes July 7 – so what are you waiting for!

Please send me:

( ) Copy(ies) of Hi-Soft Pascal on Spectrum – normally £25.00, now £22.90 each £ .

( ) Copy(ies) of Pascal/80 for Amstrad CP/M – at £39.95 – but with free Catalogue program (worth £14.95) £ :

( ) Copy(ies) of Pascal on MSX – normally £29.95 (tape) and £39.95 (disc) now £27.00 and £36.00k each £

( ) Copy(ies) of Super Pascal on Commodore 64 – normally £69.99, now £44.95 £

Total amount enclosed £ :

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Address..

```
Hisoft Pascal Amstrad CPC464
Copyright Hisoft 1983,84
All rights reserved

Alter          Compile
Delete         Exit
Find           Get text
Help           Insert
List           Move
reNumber       Put text
               Translate object
               Verify
Width          text info
               print text
>
```

year = 1900 .. 1999

If birthday is a variable of type date then you can write

birthday.month := apr

rather than using seperate variables for different fields

The 'set' is a structuring method which is unique to Pascal and its very close relatives like Modula2. Based on the mathematical idea of a set it lets you keep a collection of objects using very little storage. If you have declared *weekend* as a set of '*day*' you can use

weekend := [sat,sun]

and then use

IF d IN weekend THEN WRITE('Hooray!')

to print out 'Hooray!' on the screen if *d* is either *sat* or *sun*

Files are the final way of structuring your data. Files are normally stored on disc and can have any number of elements (assuming there is enough room on the disc). Unfortunately if you don't have a disc-based system it is impossible to implement files properly and due to quirks in many home micro operating systems different compilers have different ways of implementing them.

Pointers are the final facility that really give you extra power that you just don't have with Basic. Instead of containing something we humans can understand they actually contain an address of, or pointer to another variable. Used in record structures this means that more sophisticated data structures like binary trees and heaps are much easier.

I hope this has given you a taste for the extra facilities that Pascal can give you. As a final point when buying a Pascal compiler as a beginner to it is important that you get an implementation that compiles quickly so you can try things out easily.

Buyer's guide

Program Pascal 80 **Micro** Amstrad CP/M **Price** £39.95 **Supplier** Hi-Soft 180 High Street Dunstable, Bedfordshire Tel (0582) 696421

Program Pascal MT/+ **Micro** Amstrad CP/M **Price** £49.95 **Supplier** Digital Research, Oxford House Oxford St Newbury Berks Tel (0635) 35304

Program Turbo Pascal **Micro** Amstrad **Price** £52.00 **Supplier** Softsel Softsel House Syon Gate Way Great West Rd Brentford Middlesex Tel (01) 568 8866

Program S-Pascal **Micro** BBC/Electron **Price** £19.95 (40 or 80 track disc) **Supplier** Acornsoft Fulbourne Rd Cherry Hinton Cambridge CB1 4SB

Program QL Pascal **Micro** QL **Price** £89.95 **Supplier** Metacomco 26 Portland St Bristol Tel (0272) 428781

Program MCC Pascal **Micro** Amiga **Price** £89.95 **Supplier** Metacomco 26 Portland St Bristol

Program Super Pascal **Micro** Commodore 64 **Price** £49.99 **Supplier** First Publishing Unit 20B Horseshoe Park, Horseshoe Rd Pangbourne Berks

Program Amsoft Pascal **Micro** Amstrad **Price** £29.95 (tape) £39.95 (disc) **Supplier** Amsoft, Victoria House PO Box 10 Sunderland SR1 3AV or Hi-Soft

Program Pascal **Micro** MSX **Price** £29.95 (tape) £39.95 (disc) **Supplier** Hi-Soft 180 High Street, Dunstable Beds

THREE IN ONE

by Cy Noble

This is actually three programs in one. The first compresses the graphics data of a screen and saves it to disc or cassette. The second retrieves the compressed data, expands it and writes it back to the screen in the same mode it was in originally. The third is a small routine which will interrupt a program and save whatever is on the screen at the moment you press the <COPY> key.

Compression: Graphic screens on the Beeb use a lot of memory and disc space, 20 thousand bytes in Mode 2 for instance. This will occupy one fifth of the total space on a disc. With compression however, this can be reduced considerably, especially where large areas of the screen are the same colour.

The machine code first gets the screen start address and writes that to the disc, then reads the data off the screen. Where two consecutive bytes are the same, a marker byte is put in place of the first byte, then the following bytes are counted until a different value occurs or the count reaches the value of the marker byte. This is continued to the end of the screen data, this means up to 254 bytes can be compressed into three bytes.

Please note that 'stippled' colours cannot be compressed because no two consecutive bytes are the same and where there is a lot of it you can end up using more disc space for the compressed version.

Expansion. the reverse process is done by the second routine. The first two bytes get the screen start address. The following bytes are written to the screen until a marker byte occurs. The count and colour values are then read and used to write the appropriate number of colour bytes after which the disc is read for the next byte, and so on. Note the use of &FE (254 decimal) is the maximum permissible because the next number, &FF (255) is used as an 'END OF FILE' marker in the BEEB filing system. If you get funny pictures it may be because the colour code for a byte happened to be the same as that for the marker byte. In that case try lowering the marker byte value.

Interrupt screen dump: This little routine is tucked away in the space used for the printer buffer, which is unused by most programs. It intercepts the operating system keypress routine so that if the <COPY> key is pressed, whatever is on screen is dumped to disc under the name you nominated. This can later be compressed by the above routines and resaved using the reduced disc space. Be sure the disc you are using has enough space to take the uncompressed data in the first place.

To convert the program for Electron change the following lines

Line 320 to *Mode mode%,VDU23,1 0;0;0;0,*OPT1,0*

Line 340 to *Repeat until get=32,*OPT1,0*

Line 350 *Mode 7 End*

Finally, there are check sums given for the code. These will help you isolate any possible errors in the assembly part of the program.

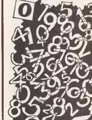
If you're using cassette then type *page=&1900* before chaining the program.

```
   10REM SCREEN COMPRESSOR & DUMP
   20REM By Cy Noble
   30REM 323 North Circular Rd.
   40REM London N13 5JH
   50IFPAGE<>&1900 CLS:PRINT"Type PR.=&1
900 <RETURN> & CHAIN again":END
   60:
   70ONERROR MODE7:CLOSE#0:REPORT:PRINT"
Error ";ERR;" at line ";ERL:END
   80MODE7:PROCass:PROCchecksum
   90IF checksum1%<> 34342 CLS:PRINT"che
cksum error in compression code":END
  100IF checksum2%<> 4190 CLS:PRINT"chec
ksum error in interrupt code":END
  110PRINT"1> Load pic, compress & save"
  120PRINT"2> Load compressed pic"
  130PRINT"3> Install Interupt code <COP
Y> to use"
  140C%=INSTR("123",GET$):IF C%>3 OR C%<
1 THEN 140
  150IFC%=2 THEN 200
  160INPUT"Name of Picture ";name$
  170IF LEN(name$)>11 PRINT"Name too lon
g":VDU7:GOTO160
  180$name=name$+CHR$13
  190IFC%=3 THEN 230
  200INPUT"Name of compressed picture ";
name2$
  210$name2=name2$+CHR$13
  220IF LEN(name2$)>11 PRINT"Name too lo
ng":VDU7:GOTO200
  230INPUT"Mode ";mode%:MODE mode%
  240IF mode%=3 OR mode%=4 OR mode%=6 PR
INT"BAD MODE":END
  250IF C%=3 PROCinstall:END
  260IF C%=2 THEN 320
  270IFname$=name2$ PRINT"Same names":VD
U7:GOTO160
  280O$="LO."+name$:OSCLI O$
  290CALL save
  300MODE 7:PRINT"Picture compressed & s
aved as "name2$' "<SPACE> to reload"
  310REPEATUNTILGET=32
  320MODE mode%
  330CALL load%
  340REPEATUNTILGET=32
  350END
  360:
  370DEFPROCass:scrptr=&9C
  380endadr=&9E:load%=&1600
  390osfile=&FFDD:find=&FFCE
  400bget=&FFD7:bput=&FFD4
  410olvec=&232:vector=&22C
  420intrup%=&880
  430FORPASS=0TO1:P%=load%
  440[OPT PASS*2
  450LDA #&40:LDX #name2 MOD256
  460LDY #name2 DIV256:JSR find
  470STA handle
  480.load2:JSR getone:STA scrptr
  490JSR getone:STA scrptr+1
  500:
  510.load3:JSR getone
  520CMP limit:BEQ marker
  530JSR toscrn:CLC:BCC load3
  540.marker:JSR getone:TAX:JSR getone
  550.bloop:JSR toscrn
  560DEX:BNE bloop:BEQ load3
  570.getone:LDY handle:JSR bget
  580BCS close:RTS
  590.close:LDY #0:LDA #0
  600JSR find:PLA:PLA:RTS
  610:
  620.toscrn:LDY #0:STA (scrptr),Y
```

```
630INC scrptr:BNE ok:INC scrptr+1
640.ok:RTS
650:
660.incptr:PHA:INC scrptr
670BNE oklo:INC scrptr+1
680.oklo:LDA scrptr
690CMP sndadr:BCC okhi
700LDA scrptr+1:CMP sndadr+1
710.okhi:PLA:RTS
720.save:LDA #name MOD256
730STA block:LDA #name DIV256
740STA block+1:LDX #block MOD256
750LDY #block DIV256
760LDA #5:JSR osfile
770LDA block+2:STA scrptr
780LDA block+3:STA scrptr+1:CLC
790LDA block+10:ADC scrptr
800STA sndadr:LDA block+11
810ADC scrptr+1:STA sndadr+1
820.gthndl:LDX #name2 MOD256
830LDY #name2 DIV256
840LDA #&80:JSR find:STA handle
850TAY:LDA scrptr:JSR bput
860LDA scrptr+1:JSR bput
870:
880.save2:LDY #0:LDA (scrptr),Y
890STA byte:LDY #1:LDA (scrptr),Y
900CMP byte:BEQ markse
910LDY handle:LDA byte:JSR bput
920JSR incptr:BCC save2
930.endsav:LDY #0:LDA (scrptr),Y
940LDY handle:JSR bput:JSR close
950.markse:LDA limit
960LDY handle:JSR bput
970LDY #0:LDX #0
980INX:JSR incptr:BCS enuf2
990INX:JSR incptr:BCS enuf2
1000.markno:LDA (scrptr),Y
1010CMP byte:BNE snuf
1020INX:JSR incptr:BCS enuf2
1030CPX limit:BNE markno
1040:
1050.snuf:TXA:LDY handle
1060JSR bput:LDA byte:JSR bput
1070JMP save2
1080.enuf2:TXA:LDY handle
1090JSR bput:LDA byte:JSR bput
1100JSR close
1110.name:EQUD 0:EQUD 0:EQUD 0
1120.name2:EQUD 0:EQUD 0:EQUD 0
1130.handle:EQUB 0
1140.byte:EQUB 0
1150.limit:EQUB 254
1160.block:EQUD 0:EQUD 0:EQUD 0
1170.trup:SEI:LDA vector:STA olvsc
1180LDA vector+1:STA olvsc+1
1190LDA #trup2 MOD256:STA vector
1200LDA #trup2 DIV256:STA vector+1
1210CL1
1220.mainend:RTS
1230:
1240]:P%=intrup%:[OPT PASS*2
1250.trup2:LDA&FC:PHA:TXA:PHA:TYA:PHA
1260LDA&EC:CMP#233:BNE out
1270LDX#name3 MOD256
1280LDY#name3 DIV256
1290JSR &FFF7
1300.out:PLA:TAY:PLA:TAX:PLA
1310STA&FC:JMP(olvec)
1320.name3:EQUD0:EQUD0:EQUD0:EQUD0
1330.trupend:]:NEXT:ENDPROC
1340:
1350DEFPROCchecksum
1360LOCAL A%
1370checksum1%=0:checksum2%=0
1380FOR A%=load% TO mainend
1390checksum1%=checksum1%+?A%:NEXT
1400FOR A%=trup2 TO name3
1410checksum2%=checksum2%+?A%:NEXT
1420ENDPROC
1430:
1440DEFPROCinstall
1450$name3="SA."+name$+CHR$32+STR$~(HIM
EM)+" 8000"+CHR$13
1460CALL trup:ENDPROC
```


SOUND COMMAND

by Brian Cadge



The Amstrad's sound envelope commands are potentially one of its most powerful features. However many users can be put off by the seemingly meaningless array of numbers that follow each command – up to 16 of them.

The program presented here (over two weeks) allows you to visually design volume and tone envelopes, test them out, load and save them. The program automatically works out the correct values to be added after the *Env* and *Ent* commands, and will produce a Basic file containing complete commands which can be merged into your own programs.

On running the screen display is split up into three main sections, the top lines of the screen show the current *Env* and *Ent* commands necessary to produce the sound designed so far, and are also used for the various menus that appear. The main part of the display is taken up with a graphical display of the sound designed with vibrato level meters displayed on the right. The bottom line contains the 'icons' used to select any particular option.

A joystick is required to use the program as it is entirely 'pointer and icon driven', making any use of the keyboard almost entirely unnecessary (except for entering filenames). Moving the pointer into the graphical area and pressing the joystick fire button will cause the next section of the current envelope to be added. The graphical display shows volume (vertically) from 0 to 15 and time (horizontally) in 1/100ths of a second.

The steeper you make a line the faster the volume will rise (if the line goes up) or

continued over the page ►

Programming: Amstrad

fall (if the line goes down) A horizontal straight line can be used to produce constant volume over a period of time whilst a vertical straight line produces instant changes in volume in a note The graph allows you to see the shape of each sound – the 'attack', sustain' and decay of the note

Next to the graphical display are the vibrato meters these allow you to specify the amount and speed of vibrato to be added to the sound – simply move the pointer to the new position required and press fire The vibrato values affect the tone envelope parameters

Along the bottom line are the six icons to select a function, point to the required icon and press fire The first icon is a musical note when selected the program will play a scale using the current values of the volume and tone envelopes this option allows you to try out your designs before saving them and incorporating them into your own Basic programs

The second icon is an envelope selecting this produces a new menu at the top of the screen Four options are available, each one is selected by pointing to the blue box next to the option required The current envelope number is displayed, this can be incremented or decremented using the *'Env Up'* and *Env Down'* options – the full 15 envelopes are supported The Cancel' option returns control to the main program and does not affect the current envelope number The 'Edit option selects the new envelope number to be edited If the envelope is not empty then the graph of the current settings is displayed, together with the vibrato settings

The next icon represents a cassette tape Selecting this produces another menu at the top of the screen allowing files to be loaded or saved Again selecting 'Cancel' will return control to the main program again Selecting load or save will prompt for a filename which must be given When saving a file only those envelopes which have been updated are saved, this is to prevent empty envelope commands wasting space in a program The files produced are Ascii Basic compatible files with line numbers starting at 500 The sound designer adds the extension *'Env* to all filenames so a file saved as *'Sounds1* could be merged into your own program and the envelopes used by typing *Merge Sounds1 Env* from Basic

Next week more listing and program notes

```
10 '
20 ' Sound Envelope Designer
30 '
40 IF HIMEM<40000 THEN 60
50 MEMORY 39999:OPENOUT "!DUMMY":MEMORY HIMEM-1:CLOSEOUT
60 MODE 1:CLS 0:INK 0,0:BORDER 0:INK 1,10:INK 2,2:INK 3,26:PEN 3:PAPER 2
70 PRINT"       SOUND ENVELOPE DESIGNER 1.0        "
80 ' M/C code for pointer
90 FOR i=40000 TO 40194:READ a$:v=VAL("&"+a$)
100 cs=cs+v:POKE i,v
110 NEXT i
120 IF cs<>22335 THEN PRINT"DATA ERROR - Check listing";CHR$(7):STOP
130 DATA CD,9C,9C,CD,24,60,87,38,FA,F5,CD,19,60,CD,8C,9C,F1,CB,67,C0,CB,47
140 DATA C4,79,9C,CB,4F,C9,60,9C,CB,57,C4,60,9C,CD,5F,C4,91,9C,18,0A,F5,3A
150 DATA 02,90,FE,C4,30,05,3C,3C,22,02,9D,F1,C9,F5,3A,02,9D,07,30,F7,50,50
160 DATA 10,F0,F5,50,01,90,87,28,0C,30,32,01,9D,F1,C9,F5,3A,01,90,FE,96,30
170 DATA 0E,3C,10,F0,3A,02,9D,47,3E,C7,90,6F,26,00,13,00,00,CD,10,0C,00,21
180 DATA E1,9C,3A,01,90,CB,3F,50,04,00,21,F1,9C,4F,06,00,09,38,02,9D,57,06
190 DATA 00,7E,00,0E,00,77,23,9D,33,7E,00,0E,00,77,20,CD,3A,8C,0D,23,14,7A
200 DATA FE,C9,30,02,10,E3,C9,80,00,CC,00,EE,00,FF,00,0E,00,A0,00,32,00,11
210 DATA 00,22,00,33,00,33,00,32,CC,33,08,22,80,00,CC,02,04,3A,64
220 ' Set Error trap for possible error when checking for disc
230 ON ERROR GOTO 250
240 disc=(1=1):|DISC:ON ERROR GOTO 0:GOTO 270
250 disc=0:RESUME NEXT
260 ' Reset all Stick definitions
270 FOR K=72 TO 78:KEY DEF K,0,0,0,0:NEXT
280 ' Function to remove leading space or minus sign
290 DEF FNs$(x)=MID$(STR$(x),2)
300 WINDOW #3,4,34,4,32
310 WINDOW #2,1,40,2,6
320 ' Define Icon characters
330 SYMBOL 254,126,129,153,255,153,129,126,0
340 SYMBOL 255,0,255,129,189,153,165,255,0
350 SYMBOL 252,0,255,195,165,189,129,255,0
360 SYMBOL 251,129,129,129,129,129,129,129,129
370 ' Display Icons on bottom line
380 LOCATE 1,25:PAPER 1:PRINT STRING$(40,32);:PAPER 2:sp$=CHR$(16)+CHR$(1)
+"  "+CHR$(14)+CHR$(2)
390 LOCATE 13,25:PRINT CHR$(237);sp$;
400 PRINT CHR$(252);sp$;
410 PRINT CHR$(253);sp$;
420 PRINT CHR$(254);sp$;
430 PRINT CHR$(203);sp$;
440 PRINT CHR$(242);
450 sp$=CHR$(15)+CHR$(2)+CHR$(233)+CHR$(15)+CHR$(1)
460 GOTO 850
470 ' Program subroutines start here
480 ' Subroutine to update vibrato meters
490 PEN 3:FOR y=0 TO 8
500 IF vib.spd>y THEN PAPER 2 ELSE PAPER 0
510 LOCATE 38,22-y:PRINT CHR$(251);
520 IF vib.var>y THEN PAPER 2 ELSE PAPER 0
530 LOCATE 39,22-y:PRINT CHR$(251);
540 NEXT
550 PEN 1:PAPER 0:RETURN
560 ' Subroutine to print vertical text
570 LOCATE x,y:FOR i=1 TO LEN(a$):PRINT MID$(a$,i,1);CHR$(10);CHR$(8);:NEXT
:RETURN
580 ' Subroutine to Ring Bell
590 ENV 2,15,-1,2:SOUND 2,20,0,15,2:RETURN
600 ' Subroutine to sound buzzer
610 ENT -2,3,-1,1,3,1,1:SOUND 2,500,20,15,0,2:RETURN
620 ' Subroutine to get text cursor position of pointer arrow
630 CURX=INT(PEEK(40193)/4)+1:CURY=INT(PEEK(40194)/8)+1:RETURN
640 ' Subroutine to construct ev$ and et$ for current envelope
650 EV$="ENV "+FNs$(enum)
660 FOR s=1 TO es(enum)
670 FOR p=1 TO 3:ev$=ev$+",":IF ev(enum,s,p)<0 THEN ev$=ev$+"-"
680 ev$=ev$+FNs$(ev(enum,s,p)):NEXT p,s
690 et$="ENT "+STR$(-enum):GOSUB 750
700 FOR i=1 TO 2:et$=et$+","+FNs$(et(enum,i,1))+",":IF i=2 THEN et$=et$+"-"
710 et$=et$+FNs$(et(enum,i,2))+","+FNs$(et(enum,i,3)):NEXT:RETURN
720 ' Subroutine to print current env and ent definitions
730 GOSUB 650:LOCATE 1,3:PEN 3:PAPER 0:PRINT ev$;:LOCATE 10,5:PRINT et$;"
";:PEN 1:RETURN
740 ' Subroutine to construct et array from vibrato values
750 IF vib.var=0 THEN FOR i=1 TO 2:et(enum,i,1)=1:et(enum,i,2)=0:et(enum,i,
3)=1:NEXT i:RETURN
760 etp=10-vib.spd:FOR i=1 TO 2:et(enum,i,1)=vib.var:et(enum,i,3)=etp:IF i=
2 THEN et(enum,i,2)=-1 ELSE et(enum,i,2)=1
770 NEXT i:RETURN
780 ' Subroutine to clear the graphics window
790 ORIGIN 0,0,32,542,40,208:CLG 0:ORIGIN 0,0,0,639,0,399:RETURN
800 ' ******************************
810 ' Main Program section starts here
820 ' ******************************
830 vib.spd=1:vib.var=0:GOSUB 490:' Init & Draw Vib Meters
840 a$="VIB SPEED":x=37:y=14:GOSUB 570
850 a$="VIB RANGE":x=40:y=14:GOSUB 570
860 PLOT 30,40,3:DRAWR 514,0:DRAWR 0,244:DRAWR -514,0:DRAWR 0,-244
870 ' Draw vertical scale on window
880 FOR i=0 TO 15:PLOT 30,40+i*16,3:DRAWR -4,0:IF i/5=i\5 THEN DRAWR -4,0
890 NEXT
900 ' Draw horizontal scale on window
910 FOR i=0 TO 64:PLOT 32+i*8,46,3:DRAWR 0,-4:IF i/5=i\5 THEN DRAWR 0,-4
920 NEXT
930 a$="VOLUME":x=1:y=12:PEN 1:GOSUB 570
940 PLOT 800,800,1:MOVE 100,34:TAG:PRINT"1/100ths SECOND";:TAGOFF
950 ' Declare arrays and initialize variables
```

```
960 DIM ev(15,5,3),et(15,2,3),es(15),ec(5,1)
970 ' env section # is -1 if non-existent
980 FOR i=2 TO 15:es(i)=-1:NEXT:es(1)=0
990 enum=1
1000 CLS #2:GOSUB 730:esec=1:lx=32:ly=40
1010 ' Main program loop
1020 ' M/C code routine displays & moves pointer until fire button is
pressed
1030 WHILE (JOY(0) AND 16)<>0:WEND:CALL 40000
1040 ' Get the text position of the pointer
1050 GOSUB 630
1060 IF CURY=25 THEN 1440:' On Icon line
1070 IF CURX=36 THEN 1120 ' On Vib Speed column
1080 IF CURX=39 THEN 1140 ' On Vib Range column
1090 IF CURX>2 AND CURX<35 AND CURY>7 AND CURY<23 THEN 1170 ' Insert next
line of graph
1100 GOSUB 390 ' Illegal so ring bell
1110 GOTO 1030
1120 IF CURY>22 OR CURY<14 THEN 1100 ' Out of Range
1130 VIB.SPD=23-CURY:GOSUB 490:GOSUB 730:GOTO 1030 ' Set new Vib Speed
1140 IF CURY>23 OR CURY<14 THEN 1100 ' Out of Range
1150 VIB.VAR=23-CURY:GOSUB 490:GOSUB 730:GOTO 1030 ' Set new Vib Range
1160 'Calculate & Display next line
1170 NY=INT(1399-PEEK(40194)*2)/16+0.5)*16:NX=INT(PEEK(40193)/2)*8
1180 IF nx<lx THEN GOSUB 610:GOTO 1030
1190 IF esec>5 THEN LOCATE 9,6:PEN 1:PRINT"MAXIMUM OF 5 SECTIONS'";:
GOSUB 6
10:FOR dd=1 TO 500:NEXT:LOCATE 1,6:PRINT STRING$(40,32);:GOTO 1030
1200 MOVE NX,50:DRAWR 0,236,2:MOVE LX,LY:DRAW NX,NY,3
1210 tim.dif=(nx-lx)/8
1220 vol.dif=(ny-ly)/16
1230 IF vol.dif=0 AND tim.dif=0 THEN GOSUB 610:GOTO 1030
1240 IF tim.dif=0 THEN step.count=0:step.size=vol.dif:pause.time=1:
GOTO 1350
1250 IF vol.dif=0 THEN step.count=1:step.size=0:pause.time=tim.
dif:GOTO 1350
1260 step.count=tim.dif:pause.time=1
1270 step.size=vol.dif/step.count
1280 IF step.size=INT(step.size) AND step.count=INT(step.count)
THEN 1350
1290 pause.time=pause.time+1:step.count=tim.dif/pause.time
1300 IF pause.time>64 THEN 1320
1310 GOTO 1270
1320 ' Can t form gradient
1330 GOSUB 610:MOVE NX,50:DRAWR 0,236,0:MOVE LX,LY:DRAW NX,NY,0
1340 GOTO 1030
1350 ec(esec,0)=lx:ec(esec,1)=ly
1360 lx=nx:ly=ny
1370 ev(enum,esec,1)=step.count
1380 ev(enum,esec,2)=step.size
1390 ev(enum,esec,3)=pause.time
1400 es(enum)=esec:esec=esec+1
1410 GOSUB 730
1420 GOTO 1030
```

Programming: Spectrum

SCREEN MAGNIFY

by S Maneggio

This is a utility for the 48K Spectrum, allowing any section of the screen display to be magnified. I find it most useful for looking at screen pictures of games, to see how the designs are made up.

The routine is quite easy to use. The screen is split up into four quarters, numbered one and two (across the top, left to right) and three and four being along the bottom. To magnify a certain quarter, you *Poke 57344*, the number of the section you want to magnify – then call the magnifier at address 57350 (see Lines 90-110).

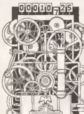
Another way of using the routine allows you to position the window to be magnified (16 across by 12 down) at any position on the screen. To do this you must

Poke 57348,x co-ordinate of window
Poke 57349,y co-ordinate of window

then call the routine at address 57352.

To install the routine, type in the program, then run it. The Data will be checked line by line – then if all is well, automatically saved.

```
5 REM ********************
10 REM *SCREEN MAGNIFIER*
20 REM *  BY S.MANEGGIO *
40 REM ********************
50 CLEAR 57000
60 GO SUB 800: REM m/c code
70 REM AN EXAMPLE OF MAGNIFIER
80 LIST 1e10
88 FOR a=1 TO 8
90 INPUT "  WHICH SCREEN SECTION DO YO
U     WANT TO MAGNIFY(1-4) ";section
100 POKE 57344,section
110 RANDOMIZE USR 57350
120 NEXT a
130 GO TO 80
800 REM HEX LOADER
810 RESTORE 1000
815 LET start=57350
820 FOR l=1000 TO 1050 STEP 10
830 READ a$,checksum
840 LET tot=0
850 FOR j=1 TO 100 STEP 2
860 LET high=CODE a$(j)-48
870 LET low=CODE a$(j+1)-48
880 LET high=high-39*(high>9)
890 LET low=low-39*(low>9)
900 LET byte=16*high+low
910 LET tot=tot+byte
920 POKE start,byte
930 LET start=start+1
940 NEXT j
950 IF tot<>checksum THEN PRINT "ERRO
R AT LINE ";l: STOP
960 PRINT "LINE ";l;" CORRECT"
970 NEXT l
980 SAVE "MAGNIFY"CODE 57350,300
990 RETURN
1000 DATA "[illegible]",5218
1010 DATA "[illegible]",5127
1020 DATA "[illegible]",5310
1030 DATA "[illegible]",4452
1040 DATA "[illegible]",4892
1050 DATA "[illegible]",4506
```



SOUND TESTER

by David Carlin

This program will help the user to experiment with the QL's *Beep* command and once loaded is very easy to use

You simply select using the *Up* and *Down* cursor keys, which of the *Beep* commands eight parameters you wish to alter: the current parameter being highlighted with a white background. Then by using the *Left* and *Right* cursor keys the value of that parameter can be decreased or increased.

By then using the five function keys, the sound created in the five different limits can be heard

Program notes

Line No	
130	Set initial *Beep* command values
160-190	Set screen size and paper colours
200	Calls the procedure *Initiate*
210	Calls the procedure *Alter*
220-570	Proc *Initiate* Sets out screen display
580	Proc *Alter*
630-810	Determines which parameters are to be altered and by how much
820-870	Selects which type of *Beep* is to be heard
880-1050	Checks to make sure that values stay within their limits
1060-1080	Displays in channel 0 the values of the eight parameters
1090-1280	Procs F1-F5 Sounds the *Beep* command in its different stages
1290-1420	Screen data

```
100 REMark SOUND TESTER
110 REMark (C) DAVID CARLIN
120 OPEN #3,SCR
130 LET D=3000:P=40:P2=0:GX=1500:GY=1:W=0:F=1:R=0
140 RESTORE
150 MODE 4
160 WINDOW 448,200,32,16:PAPER 170
170 WINDOW #0,448,40,32,216:INK #0,0
180 PAPER #0,2
190 CLS:CLS #0
200 INITIATE
210 ALTER
220 DEFine PROCedure INITIATE
230 DIM A$(17,15)
240 DIM B$(17,20)
250 DIM C$(15,20)
260 CSIZE 3,1
270 INK 0
280 AT 0,0:UNDER 1:PRINT "SOUND TESTER":UNDER 0
290 CSIZE 2,0
300 STRIP 150
310 INK 7
320 FOR A= 3 TO 17 STEP 2
330 B=1
340 READ A$(A)
350 AT A,B:PRINT A$(A)
360 END FOR A
370 FOR A=3 TO 17 STEP 2
380 READ B$(A)
390 STRIP 7,4,2
400 INK 0
410 AT A,(B+13):PRINT B$(A)
420 END FOR A
430 AT 3,47:STRIP 6:INK 7:PRINT " PRESS THE FOLLOWING "
440 FOR A= 5 TO 15 STEP 2
450 READ C$(A)
460 STRIP 4,7,0
470 INK 0
480 AT A,(B+42):PRINT C$(A)
490 END FOR A
500 STRIP 7:INK 7
510 AT 15,48:PRINT "        USE CURSOR KEYS        "
520 AT 16,48:PRINT CHR$(208);" & ";CHR$(216);"  TO SELECT PARAMETER "
530 AT 17,48:PRINT CHR$(192);" & ";CHR$(200);" TO ALTER PARAMETER "
540 CURSOR 140,189:STRIP 0:PRINT "
 "
550 CURSOR 132,185:STRIP 7:INK 0:PRINT " BY DAVID CARLIN ... RANGE 1986 "
560 A=3:B=1
570 END DEFine
580 DEFine PROCedure ALTER
590 REPeat LOOP
600 INK 7
610 AT A,B:STRIP 188:PRINT A$(A)
620 REMark SCAN KEYBOARD FOR ACTS OF INPUT
630 K1=KEYROW(1)
640 IF K1&&4 THEN LET A=A-2:IF A < 3 THEN LET A=3
650 IF K1&&128 THEN LET A=A+2:IF A>17 THEN LET A=17
660 IF K1&&2 AND A=3 THEN LET D=D-100
670 IF K1&&16 AND A=3 THEN LET D=D+100
680 IF K1&&2 AND A=5 THEN LET P=P-10
690 IF K1&&16 AND A=5 THEN LET P=P+10
700 IF K1&&2 AND A=7 THEN LET P2=P2-10
710 IF K1&&16 AND A=7 THEN LET P2=P2+10
720 IF K1&&2 AND A=9 THEN LET GX=GX-100
730 IF K1&&16 AND A=9 THEN LET GX=GX+100
740 IF K1&&2 AND A=11 THEN LET GY=GY-1
750 IF K1&&16 AND A=11 THEN LET GY=GY+1
760 IF K1&&2 AND A=13 THEN LET W=W-1
770 IF K1&&16 AND A=13 THEN LET W=W+1
780 IF K1&&2 AND A=15 THEN LET F=F-1
790 IF K1&&16 AND A=15 THEN LET F=F+1
800 IF K1&&2 AND A=17 THEN LET R=R-1
810 IF K1&&16 AND A=17 THEN LET R=R+1
820 K0=KEYROW(0)
830 IF K0&&2 THEN F1
840 IF K0&&8 THEN F2
850 IF K0&&16 THEN F3
860 IF K0&&1 THEN F4
870 IF K0&&32 THEN F5
880 REMark CHECKS THAT PARAMETERS ARE WITHIN THEIR RANGE
890 IF D < -32768 THEN LET D = -32768
900 IF D > 32767 THEN LET D = 32767
910 IF P < 0 THEN LET P = 0
920 IF P > 255 THEN LET P = 255
930 IF P2 < 0 THEN LET P2 = 0
940 IF P2 > 255 THEN LET P2 = 255
950 IF GX < -32768 THEN LET GX = -32768
960 IF GX > 32767 THEN LET GX = 32767
970 IF GY < -8 THEN LET GY = -8
980 IF GY > 7 THEN LET GY = 7
990 IF W < 0 THEN LET W = 0
1000 IF W > 15 THEN LET W = 15
1010 IF F < 0 THEN LET F = 0
1020 IF F > 15 THEN LET F = 15
1030 IF R < 0 THEN LET R = 0
1040 IF R > 15 THEN LET R = 15
1050 END IF
1060 CSIZE #0,1,0
1070 AT #0,0,17:PRINT #0;"SOUND BEING GENERATED"
1080 AT #0,1,10:PRINT #0;" BEEP ";D;",";P;",";P2;",";GX;",";GY;",";W
;",";F;",";R;"     "
1090 INK 0
1100 AT A,B:STRIP 7:PRINT A$(A)
1110 PAUSE 2000
1120 END REPeat LOOP
1130 END DEFine
1140 DEFine PROCedure F1
1150 BEEP D,P
1160 END DEFine
1170 DEFine PROCedure F2
1180 BEEP D,P,P2,GX,GY
1190 END DEFine
1200 DEFine PROCedure F3
1210 BEEP D,P,P2,GX,GY,W
1220 END DEFine
1230 DEFine PROCedure F4
1240 BEEP D,P,P2,GX,GY,W,F
1250 END DEFine
1260 DEFine PROCedure F5
1270 BEEP D,P,P2,GX,GY,W,F,R
1280 END DEFine
1290 DATA " DURATION  "," PITCH     "," PITCH_2   "," GRAD_X    ","
GRAD_Y    "," WRAP      "," FUZZY     "," RANDOM    "
1300 DATA " RANGE -32768 TO 32767 "
1310 DATA " RANGE 0 TO 255        "
1320 DATA " RANGE 0 TO 255        "
1330 DATA " RANGE -32768 TO 32767 "
1340 DATA " RANGE -8 TO 7         "
1350 DATA " RANGE 0 TO 15         "
1360 DATA " RANGE 0 TO 15         "
1370 DATA " RANGE 0 TO 15         "
1380 DATA " F1 for Duration,Pitch          "
1390 DATA " F2 for pitch_2,grad_x,grad_y "
1400 DATA " F3 for Wrap                    "
1410 DATA " F4 for Fuzzy                   "
1420 DATA " F5 for Random                  "
```

Large Print on Amstrad

by G A Bobker

The simplest method to produce large characters on the screen is to use the black square character to build-up the required shapes. This is fine for letters using straight lines but looks terrible for X,Z,S, etc. By redefining just seven new character shapes, *all* letters can be produced in large format neatly. If using *Mode 2* it is best to thicken all vertical lines as the Amstrad doesn't produce square character areas in this mode. Shapes f and g are for the centre parts of X and the awkward parts of B, K and R.

Size of the characters are limited by letters such as M,N,W,X & Z as the slopes dictate practical size of them. In practice large printing means about three lines of eight characters in *Mode 2*.

Lines 110 to 180 redefine lower case letters a to g to be the new shapes, therefore shapes in lines 1000 onwards must be entered as lower case letters. It is best to enter later commands in upper case (Capitals).

Use simple *Print* commands when entering the shapes so that the characters can be observed building-up in the listing. *Tab* or *Locate* can be added after program print has been tested out.

```
100 MODE 2: BORDER 2
110 SYMBOL AFTER 97
120 SYMBOL 97,255,255,255,255,255,255,255,255
130 SYMBOL 98,128,192,224,240,248,252,254,255
140 SYMBOL 99,255,127,63,31,15,7,3,1
150 SYMBOL 100,1,3,7,15,31,63,127,255
160 SYMBOL 101,255,254,252,248,240,224,192,128
170 SYMBOL 102,255,254,252,248,248,252,254,255
180 SYMBOL 103,255,127,63,31,31,63,127,255
970 '
980 ' ENTER SHAPE USING LOWER CASE a to g
990 '
1000 PRINT "daaaaaaab   ab      da   daaaaaaab
1010 PRINT "aa      aa   aab    daa   aa      aa
1020 PRINT "aa      aa   aaab  daaa   aa
1030 PRINT "aaaaaaaaa   aacabdaeaa   caaaaaaab
1040 PRINT "aa      aa   aa caae aa           aa
1050 PRINT "aa      aa   aa  ce  aa   aa      aa
1060 PRINT "aa      aa   aa      aa   caaaaaaae
1070 PRINT:PRINT
1080 PRINT "daaaaaaab   daaaaaaab   aaaaaaaae
1090 PRINT "aa      aa   aa      aa        dae
1100 PRINT "aa      aa   aa      aa       dae
1110 PRINT "aa      aa   aa      aa      dae
1120 PRINT "aa      aa   aa      aa     dae
1130 PRINT "caaaaaaae   caaaaaaae    dae
1140 PRINT:PRINT
1150 PRINT "aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
```

M/C Converter on Commodore 64

by Andrew Mann

This program causes a small wedge to be inserted into the normal Basic processing loop that allows recognition of hexadecimal and binary numbers. For example *Print $OF2A* *Poke12000 %10010110* will work correctly.

The new bases will work correctly in mathematical expression, there is only one limitation: hex numbers must consist of four digits and binary numbers must consist of eight digits.

Type in the program then *Run*. When the *Ready* prompt appears type New to delete the loader. Hex and binary processing will now have been added. The machine code is poked into memory from 49152 onwards.

```
10 DATA 169,11,141,10,3,169,192,141
20 DATA 11,3,96,169,0,133,13,32
30 DATA 115,0,201,36,240,13,201,37
40 DATA 240,6,32,121,0,76,141,174
50 DATA 76,85,192,162,2,32,115,0
60 DATA 201,64,144,2,105,8,10,10
70 DATA 10,10,133,254,32,115,0,201
80 DATA 64,144,2,105,8,41,15,5
90 DATA 254,72,202,208,224,104,160,104
100 DATA 133,98,132,99,162,144,56,32
110 DATA 73,188,76,115,0,162,0,134
120 DATA 254,162,8,138,168,136,32,115
130 DATA 0,56,233,48,192,0,240,4
140 DATA 10,136,208,252,24,101,254,133
150 DATA 254,202,208,231,164,254,169,0
160 DATA 32,145,179,76,115,,0
170 FORI=49152TO49278
180 READX
190 POKEI,X
200 NEXT
210 SYS 49152
```

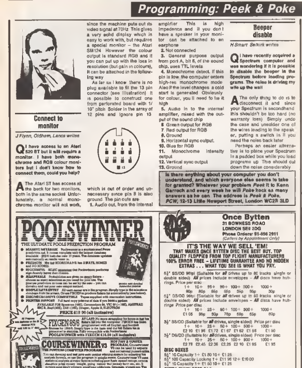
Bit Map Text on Commodore 128

by S J Dunn

This program allows capital letter text to be placed on a bit mapped screen. It can be added to any Basic program. It is called by first putting the text in *A$* and the *X* and *Y* co-ordinates in X and Y.

To add two programs together: 1) Load in the first program (*DLOAD "Filename"*). 2) Add the second file with *BLoad Filename2, P(Dec("1C00") + 58109-Fre(0)+ 1)*. 3) Renumber and Save with Renumber:Dsave "Newname".

```
9000 REM *TEXT ON B/MAP SCREEN*
9010 REM *PRINT A$ AT X,Y*
9020 REM *CALLED IN PROG BY GOSUB 9000*
9030 P=320*INT(Y)+8*INT(X)+DEC("2000")
9040 BANK 14
9050 FOR I=1 TO LEN(A$)
9060 B$=MID$(A$,I,1)
9070 B=ASC(B$)-65
9080 FOR RD=0 TO 7
9090 IF ASC(B$)<>32 THEN V=PEEK(8*B+DEC("D007")+RD)
9100 IF ASC(B$)=32 THEN V=0
9110 POKE I*8+PD+RD,V
9120 NEXT
9130 NEXT
9140 RETURN
```



Connect to monitor

J Flynn, Oldham, Lancs writes

Q **I have access to an Atari 520 ST but it will require a monitor. I have both monochrome and RGB colour monitors but I don't know how to connect them, could you help?**

A The Atari ST has access at the back for two monitors, both in the same socket. Unfortunately, a normal monochrome monitor will not work, since the machine puts out its video signal at 70Hz. This gives a very solid display which is easy to work with, but requires a special monitor – the Atari SM124. However the colour output is standard RGB and if you can put up with the loss in resolution (but gain in colours), it can be attached in the following way.

As far as I know there is no plug available to fit the 13 pin connector (see illustration). It is possible to construct one from perforated board with 1/10" pitch. Solder in the array of 12 pins and ignore pin 13 which is out of order and unnecessary since pin 8 is also ground. The pin outs are:

1. Audio out, from the internal amplifier. This is high impedance and if you don't have a speaker in your monitor can be attached to an earphone.
2. Not connected
3. General purpose output from port A, bit 6, of the sound chip, uses TTL levels.
4. Monochrome detect. If this pin is low the computer enters high-res monochrome mode. Also if the level changes a cold start is generated. Obviously for colour, you'll need to tie it high.
5. Audio in to the internal amplifier, mixed with the output of the sound chip.
6. Green output for RGB
7. Red output for RGB
8. Ground
9. Horizontal sync output.
10. Blue for RGB
11. Monochrome intensity output
12. Vertical sync output
13. Ground

Beeper disable

H Smart, Selkirk writes

Q **I have recently acquired a Spectrum computer and was wondering if it is possible to disable the beeper in the Spectrum before loading programs. The noise is driving my wife up the wall.**

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Soft solutions

Buying a modem is only the first step towards computer communications. Even though it may have free software, it may not do all you want David Wallin explains

Today I'll be explaining about the software side of communications

As I have said before the quality of the software is perhaps the most important thing to be considered when buying a modem With many modems the accompanying software is not of a very high standard and it is often the case that serious users will want to upgrade their software For most computers the BBC, Amstrad Commodore etc software packages tend to be of a standard and will work with most modems With micros such as the Spectrum which are as unstandard as you get, no RS232/432 interface etc you will have to check that the software which you are interested in is compatible with your modem

Firstly there are two main types of software Ascii and Viewdata compatible Viewdata boards require you to have Viewdata compatible software and Ascii requires Ascii compatible software

Since all Viewdata boards are 1200/75 there is no point in getting Viewdata software if you have only a 200/300 baud modem If you have a 1200/75 baud modem and only Ascii software then Viewdata software is worth buying if you can get it. The great thing about Viewdata boards is that they are all the same specifications so you don't have to worry about protocols parity word length or number of stop bits There isn't much to say about buying Viewdata software except make sure you can prepare frames and messages off-line which saves a fair bit of money in the long run and is worth an extra few quid to buy it Viewdata boards include Prestel and Micronet and the chart topping MicroGnome/Gnome at Home

If you want access to all the other BBs in the country then you will have to worry about protocols parity word length and number of stop bits but it's all fairly simple Firstly as regards software, make sure you can select all the speeds that your modem is compatible with a £900 modem with all the speeds thinkable is not good if the software will only work at 300/300!

The data protocol (or just protocol) is just the name given to the settings of the speed word length parity start and stop bits Your manual will tell you how to select the protocol you want eg, on the BBC B with the Le Modem and Le Terminal software which comes with it you just type

*DATA (number) RETURNS

The number is the number of the protocol you want With most modems if you select a baud rate then one protocol the most common for that speed is automatically selected

The word length is the number of bits (binary digits 1s and 0s) which 'make up the character It is the number of bits in the binary respresentation of the character's Ascii code The standard word length is seven bits or occasionally eight But for some applications anything from five to eight bits may be used

The parity tells the computer how the Ascii code is made up If parity is set to even then the number of positive bits, those set to 1, must be even, eg 0010011 has only three positive bits and would be changed to 10010011 to make the number of positive bits even

0011011 would be changed to 00011011 because the left hand bit is the parity 1 or 0 depending on whether it is needed or not.

There are four main types of parity available Odd odd parity selected, Even even parity selected, None there are no parity bits, Ignore all parity bits are ignored If a word length of eight bits is selected then no parity is automatically selected

Start and stop bits are bits sent at the start and end of the character surprise surprise and are used to tell which computer is sending and receiving and keep them synchronised

Other features you should look out for include the following

On-line printing – this feature lets you get a printout of everything you receive and send, handy for your first logs on

Ascii download/upload – this lets you send and receive programs via your modem to and from the Bulletin Board

Automatic log-on – You tell the computer how you log on the order you give the BB your name password etc This lets you just press a key when you have dialled up and the computer does the boring stuff

Editor – an editor on communications software is like a mini word processor and lets you edit and alter files before or after you have up/downloaded them

Other software features are available You should look for as many features as you can It's worth the extra money

Improved hacking

The New Hacker's Handbook **is a revision of the pseudonymous Hugo Cornwall's best-selling – and notorious – *Hacker's Handbook* The original you may recall, ruffled feathers at the time of its launch last year.**

It never was that dangerous – it truth be told it probably wasn't dangerous at all – but the denunciations helped sales.

But controversy aside, the Handbook was always a useful book for those interested in communications, as opposed to those wanting to learn how to interfere with the Duke of Edinburgh, and the revised version is no exception It presents a detailed guide to computer communications in both the technical and historical senses, and although it does have a fair amount of anecdotal material on hacking it is also a solidly presented textbook.

This includes details of systems and equipment, plus an excellent series of appendices covering troubleshooting, modem types and so on If you're interested in comms, and you don't have the earlier version, the book is well worth buying £6 95 from Century Hutchinson

If you have any queries tips or comments to make about any aspect of micro communications, David Wallin would love to hear from you

Write to him at *Popular Computing Weekly*, 12-13 Little Newport Street London WC2H 7PP



Turn your micro into a guitar

Computer music isn't all about synthesisers. Mark Jenkins looks at some guitar tutor packages

Just to show that you don't have to be a keyboard wizard to get into micro music, we're going to look at three packages which will turn your computer into a guitar tutor

One of the great advantages of using a computer as a teacher is that you can go at your own speed and repeat the lesson as many times as you like at any speed you like Micro Music's *Guitar Studio* packages are accompanied by large well-presented text books which use conventional musical notation to illustrate each lesson

Auto-metronome

Guitar Studio One (with software on disc or tape) opens with a tuning aid which will generate the pitch of each open string in turn and goes on to display or play each musical example from the book Various sounds are available so that the lessons don't get too boring and examples can be played at any speed Chord naming timing and string fingering are all covered and an auto metronome from the computer helps you to 'play along' on the more difficult examples – it's also possible to us the examples in any order A display of the guitar fingerboard shows which fingers to use on each chord This idea is expanded on *Guitar Studio Two*, which is a chord dictionary with around 500 chords a programming facility to create new chords and chord patterns and a practice option which asks you to play along with a selection of backings

Guitar Studio Three is more concerned with music theory, although it does put theory into practice by displaying all its chords triads and intervals both as notes on a music stave and as symbols on a guitar fretboard With a comprehensive test section this package looks like being an invaluable educational aid

All three packages have been developed by Ian Taylor who teaches guitar at York University and David Ashworth, of the York Guitar Study Centre The package are £9 95 each and available from Micro Music St Michael's Chambers, Spurriergate York (0904 647588)

Going a little more up-market, Syndromic Music is now importing software from the American company Hybrid Arts Much of this software is based in the very inexpensive Atari 130XE (around £269 with disc-drive for an 8-bit 128K machine!), plus a Midi interface which allows the computer to compose for and play Midi synthesisers As we've discussed in the past, Midi synths now start at about £245 for the excellent Casio CZ-101 which is capable of playing eight-note chords or four simultaneous single notes with different sounds With a powerful programmable digital sound generation system called *Phase Distortion* the 101 is the perfect start in Midi-compatible micro music

Fretboard chord dictionary

Punch-out

Syndromic's package for the 130XE is called *Midi Track II*, and with an interface computer discdrive and software will cost around £475 (it's all available separately if you already have the micro) The package allows real time and Step Time composing with advanced editing functions 10 500 note capacity simultaneous playing on all 16 Midi channels and a straightforward single screen display You can 'punch-in' and 'punch-out' to correct recordings loop and chain sections without using additional memory set delays between different channels, automatically correct the timing of your playing and much more

It's also possible to synchronise the package to Midi equipment such as drum machines to tape or even to video using SMPTE code generator Since the package will read clocks as slow as one pulse per beat, even the oldest electronic instruments can be linked up, and you can even use a click from a microphone

Also for the 130XE is an editor/library package for sounds on Yamaha DX7-type synthesisers DX7 and Casio CZ patch libraries Librarian packages for the Oberheim OB8 Prophet 5 and Drumtraks drum machine, and an editor for the popular Ensonia Mirage sampler For the more professional Atari 520ST and 1040ST there's a powerful sequencer program the Oasis Mirage editor (with a version for Akai's new S900 sampler to come) and the DX-Droid which uses artificial intelligence principles to invent sounds for the Yamaha DX7 (with 147 parameters to program it's beyond most humans!)

Syndromic will shortly have a new showroom in North London where it'll be demonstrating all its Atari packages C64 packages such as the Midi-compatible Tron Digidrum III, Joreth and Steinberg music software and keyboards from Akai Yamaha and Roland Syndromic Music can be contacted on 01-883 1335

Finally a thought for the week would a micro music glossary be useful for anyone who is a little unclear on some of the terms used?

If you have any queries or tips for this column, please write to Mark Jenkins at *Popular Computing Weekly* 12-13 Little Newport St London WC2H 7PP Mark would also welcome examples of your own music, on tape or disc

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New Releases

John Cook looks through this week's new arrivals

Amstrad

Program *Snodgits* **Type** Arcade/Adventure **Micro** Amstrad **Price** £1 99 **Supplier** Creative Sparks, Unit B11, Armstrong Mall, Southwood Summit Centre, Southwood, Farnborough Hampshire GU14 0NP

Program *Sai Combat* **Type** Arcade **Micro** Amstrad **Price** £8 95 (tape) £13 95 (disc) **Supplier** Mirrorsoft Purnell Book Centre Paulton, Bristol BS18 5LQ

Progrm *The Beer Hunter* **Type** *Adventure* **Micro** Amstrad **Supplier** Global Software, PO Box 67 London SW11 1BS

There are many that would say *The Quill* had a lot to answer for – mainly an epidemic of pixies, magic rings and evil forces that can only be overcome by *Taking* this, *Dropping* that and *Examining* everything else

So it's nice to see that the authors of the first commercial adventure to be developed using Incentive's *Graphic Adventure Creator (GAC)* have at least tried to break out of the old formula. It's called *The Beerhunter*

Yes a subtle little play on words that you will find either tickles your ribs – or sends you into a massive depression If the latter is the case don't bother even looking at this one, as it's full of similar material

The scenario has you out on the streets looking for ale to revive a party that's just gone dry – starting in the gents lavatory of the *Hung Ferret*, your local Commands are little more than standard verb/noun – take all, for instance, being ignored

After playing the game for twenty minutes or so though I have to say that I was not impressed with the adventure itself The parser comes up with *Can't do that!* far too often for comfort, the humour tends to be of the type that only connects after two or three pints of Old Gutbucket, and anything I can get 20% of the way through after such a short time has to be of suspect quality

There is a market for quirky adventures – *Hampstead* for instance – but *The Beerhunter* falls short by some way

Program *Buster Block* **Type** Arcade **Micro** Amstrad **Price** £6 95 **Supplier** Kuma Computers 12 Horseshoe Park, Pangbourne, Berkshire, RG8 7JW

Program *Skyfox* **Type** Arcade **Micro** Amstrad **Price** £15 95 (disc) **Supplier** Ariolasoft, 68 Long Acre Covent Garden London WC2E 9JH

Atari ST

Program *Bulletin Board System* **Type** Utility **Micro** Atari ST **Price** £29 95 **Supplier** Microdeal 41 Truro Road Austell, Cornwall, PL25 5JE

Program *Direct File Transfer* **Type** Utility **Micro** Atari ST **Price** £29 95 **Supplier** Microdeal 41 Truro Road Austell Cornwall, PL25 5JE

Program *Disc Help* **Type** Utility **Micro** Atari ST **Price** £29 95 **Supplier** Microdeal 41 Truro Road Austell, Cornwall, PL25 5JE

Program *Mudpies* **Type** Arcade **Micro** Atari ST **Price** £19 95 **Supplier** Microdeal 41 Truro Road Austell Cornwall PL25 5JE

Apple II

Program *Alter Ego* **Type** Strategy **Micro** Apple II **Price** £24 99 (disc) **Supplier** Activision UK, 23 Pond St Hampstead London NW3

Pick of the week

Spectrum Biggles

Program *Biggles* **Type** Arcade **Micro** Spectrum **Price** £9 95 **Supplier** Mirrorsoft Purnell Book Centre Paulton Bristol

Wizard, everybody – *Biggles* has just arrived on the Spectrum And what's this with the press release – yuk – a tacky white polyester flying scarf with Biggles written all over it

You might hear it claimed elsewhere that *Biggles (The Game)* is a product that has been hyped' Tell those people they are wrong Hype is a white *silk* scarf with Biggles *embroidered* on it So having got that out of the way on to the game

As conversion jobs from the Commodore go this is a good one, with both the screen appearance and the gamesplay being almost identical And it's fun

The plot closely follows that of the film, which has Biggles (WWI flying ace who flies with a straight bat and a chum called Algy) caught up in some timewarp with – cough – an American The first side of the tape concentrates on this bit flitting between the trenches and the present in a series of three arcade sequences – attempting to gain a password that will aid you on the other side of the tape although it is not absolutely essential to playing the side two game This is a semi helicopter simulator semi-adventure in which you must locate the secret weapon and destroy it

So there you have it – a colourful loud game-of-the-movie that is unlikely to disappoint the younger player and even has moments of amusement for the older Spitfing

Program *Bard's Tale* **Type** Adventure **Micro** Apple II **Price** £19 95 (disc) **Supplier** Ariolasoft, 68 Long Acre Convent Garden London WC2

BBC B

Program *Street Patroller* **Type** Adventure **Micro** BBC B **Price** £4 00 **Supplier** Central Computing 61 Beech Road Gillway, Tamworth, Staffs, B79 8QO

Program *The Price of Magik* **Type** Adventure **Micro** BBC B **Price** £9 95 **Supplier** Level 9 Computing PO Box 39 Weston-Super-Mare Avon BS24 9UR

Program *The Complete BBC* **Type** Arcade Compilation **Micro** BBC B **Price** £19 95 **Supplier** Audiogenic Software 12 Chiltern Enterprise Centre Station Road Theale Berkshire RG7 4AA

Commodore 64/128

Program *Mail Order Monsters* **Type** Arcade **Micro** Commodore 64 **Price** £11 95 **Supplier** Ariolasoft 68 Long Acre Convent Garden, London WC2E 9JH

Program *Core* **Type** Arcade/Adventure **Micro** Commodore 64 **Price** £8 95 **Supplier** A&F Software Liberty House, 222 Regent St London W1R 7DB

Program *Danger Mouse in Double Trouble* **Type** Arcade **Micro** Commodore 64 **Price** £1 99 **Supplier** Creative Sparks address as above

Program *Mad Doctor* **Type** Arcade/Adventure **Micro** Commodore 64 **Price** £1 99 **Supplier** Creative Sparks, address as above

Program *Tubular Bells* **Type** Entertainment **Micro** Commo-

dore 64 **Price** £7 95 **Supplier** Nu Wave Software, CRL House, 9 Kings Yard Carpenters Rd, London E15 2HD

I can remember when *Psychedelia* came out – I thought it one of the best things that had ever come on the software scene because it allowed anyone to use their computer as a simple creative tool

Now eighteen months after the event Nu Wave (a CRL label) have taken that light synthesiser concept and taken it a step forward or is it a step back?

Tubular Bells is an attempt to produce an automatic light-to-music show You plug in the computer, load in the program and the machine plays an acceptable three part version of the Mike Oldfield classic while producing some synchronised graphics – mostly coloured lines sweeping across the screen

Ten out of ten for originality eight out of ten for implementation – the sound track is faithful to the original and the graphics do their job well but one thought lingers in the mind What s the point?

CRL describes it as an exercise in getting ex-computer users to switch their Commodores on again and no-one can but applaud that. But how long are they going to stay on?

Program *White Viper* **Type** Arcade **Micro** Commodore 64 **Price** £1 99 **Supplier** Creative Sparks address as above

Program *Alter Ego (Female Version)* **Type** Strategy **Micro** Commodore 64 **Price** £24 99 **Supplier** Activision 23 Pond St, Hampstead, London NW3 2PN

Commodore Plus/4

Program *Tape 3+ 1* **Type** Utility **Micro** Plus/4 **Price** £4 99 + 50p p&p **Supplier** A M Chaudhrey 121 Grasmere Way Linsdale Leighton Buzzard Beds LU7 7QL

When Commodore released the Plus/4 with its built-in software, mediocre thought it was it was considered to be quite a selling point Until everyone found out that when loading and saving it defaulted to disc There is no doubt that this contributed to the initial failure of the machine in the UK and everywhere else come to think of it If only this program had been around then

Tape 3+ 1 is a short program (it takes about 1½ minutes to load) that simply allows you the option to save or load Plus/4 generated wordprocessor/spreadsheet files onto tape it really is that simple

It still isn t going to appeal to anyone that want to do anything vaguely serious – a five line letter took 30 seconds or so to save – but if you want to experiment with your Plus/4 then it's well worth the money

It's nice to see that the back bedroom boys can still spot a gap in the market and go on to exploit it. Congratulations A M Chaudhray and let me assure everyone else This guy s going to clean up

It could only happen on the Plus/4

MSX

Program *Macadam Bumper* **Type** Arcade **Micro** MSX 64K **Price** £8 95 **Supplier** PSS 452 Stoney Stanton Rd Coventry CV6 5DG

You ll be pleased to know that pinball is making a slow but steady comeback in the arcades with some amazingly well designed multi-level tables masses of flashing lights and sampled sound But if you can't make it to (or daren't enter within) one of those dens of iniquity a decent pinball designer is an acceptable second best: enter *Macadam Bumper* programmed by that awfully French company Ere Infomatique and published by PSS in this country

The program has been about for some time on Amstrad and Spectrum and now is available on MSX.

As before you can play the existing tables modify them or create your own straight from scratch mainly under cursor control You can produce some pleasing results fairly quickly and any pinball loving MSX owner is not going to be disappointed

PCW 8258

Program *Stock Control & Invoicing* **Type** Utility **Micro** Amstrad PCW 8256/8512 **Price** £59 95 **Supplier** Cavalier Software PO Box 32, London SE15 2HS

QL

Program *Vroom* **Type** Arcade **Micro** QL **Price** £12 99 **Supplier** Pyramide, Reo Promotions 28 Waverly Grove London N3

Program *Mortville Manor* **Type** Arcade/Adventure **Micro** QL **Price** £12 99 **Supplier** Pyramide Reo Promotions 28 Waverly Grove London N3

Spectrum

Program *Snodgits* **Type** Arcade/Adventure **Micro** Spectrum **Price** £1 99 **Supplier** Creative Sparks, address as above

Program *Danger Mouse in Double Trouble* **Type** Arcade **Micro** Spectrum **Price** £1 99 **Supplier** Creative Sparks, address as above

Program *Kidnap* **Type** Arcade **Micro** Spectrum 48K **Price** £1 99 **Supplier** Creative Sparks address as above

This week sees yet another budget label launched upon an unsuspecting world, Sparklers, from a revamped Creative Sparks label The initial range is a curious collection of old titles (now offered at a budget price for the first time) and newer ones

Mad Doctor for instance, an everyday story of murder and mayhem – and *Danger Mouse in Double Trouble* is excellent value at this price too On the other hand there s *Kidnap* The credits on this game say 1985 it looks more like early 1984 to me Believe it or not your task is to rescue (collect) frozen babies

It soon becomes apparent the rooms are guarded by all manner of weird creatures and bizarre machines goes the blurb From that alone you can guess it's a *JSW* clone – and it is

Unless you're into collecting every single *JSW* derivative I think you ll find this particular Sparkler something of a damp squib

Program *Caverns of Kontonia* **Type** Arcade **Micro** Spectrum **Price** £1 99 **Supplier** Atlantis Software 19 Prebend St London N1 8PF

Program *Mafia Contract II (The Sequel)* **Type** Adventure **Micro** Spectrum **Price** £1 99 **Supplier** Atlantis Software 19 Prebend St, London N1 8PF

Program *Luna Attack* **Type** Arcade **Micro** Spectrum **Price** £1 99 **Supplier** Atlantis Software, see address above

Program *The Very Big Cave Adventure* **Type** Adventure **Micro** Spectrum **Price** £7 95 **Supplier** CRL 9 Kings Yard Carpenters Road London E15

Program *Iwo Jima* **Type** Strategy **Micro** Spectrum **Price** £7 95 **Supplier** PSS 452 Stoney Stanton Rd, Coventry, CV6 5DG

Charts

Top Twenty

1	(1)	World Cup Carnival *(Various)*	**US Gold**
2	(2)	Kik Start *(Spectrum, C64, C16, Atari)*	**Mastertronic**
3	(5)	Thrust *(C64)*	**Firebird**
4	(4)	Formula One Simulator *(Various)*	**Mastertronic**
5	(13)	Knight Tyme *(Spectrum)*	**Mastertronic**
6	(3)	Batman *(Spectrum, Amstrad)*	**Ocean**
7	(9)	Spindizzy *(Spectrum, C64, Amstrad)*	**Electric Dreams**
8	(6)	Commando *(Various)*	**Elite**
9	(8)	International Karate *(Spectrum, C64)*	**System 3**
10	(10)	Biggles *(Spectrum, C64)*	**Mirrorsoft**
11	(20)	They Sold *(Spectrum C64, Amstrad)*	**Hit Squad**
12	(15)	Vegas Jackpot *(Various)*	**Mastertronic**
13	(18)	Ninja Master *(Spectrum)*	**Firebird**
14	(7)	Cauldron 2 *(C64)*	**Palace**
15	(–)	Spellbound *(Spectrum, C64, Amstrad)*	**Mastertronic**
16	(–)	Heavy On The Magik *(Spectrum)*	**Gargoyle Games**
17	(14)	Last V8 *(C64 Amstrad, Atari)*	**Mastertronic**
18	(11)	Saboteur *(Spectrum, C64, Amstrad)*	**Durell**
19	(10)	Rock 'N' Wrestle *(Sp, C64, Am)*	**Melbourne House**
20	(–)	Way Of The Tiger *(Sp, C64 Ams)*	**Gremlin Graphics**

Top Tens

All figures compiled by Gallup/Microscope

Amstrad

1	(2)	Winter Games	(Epyx/US Gold)
2	(1)	Batman	(Ocean)
3	(5)	World Cup Carnival	(US Gold)
4	(–)	They Sold (2)	Hit Squad
5	(3)	Commando	(Elite)
6	(8)	Last V8	(Mastertronic)
7	(9)	One Simulator	(Mastertronic)
8	(7)	Elite	(Firebird)
9	(10)	Into Oblivion	(Mastertronic)
10	(4)	Get Dexter	(PSS)

Commodore 64

1	(2)	Thrust	(Firebird)
2	(3)	Int Karate	(System 3)
3	(1)	World Cup Carnival	(US Gold)
4	(4)	Cauldron 2	(Palace)
5	(–)	Nexus	(Nexus)
6	(7)	Spindizzy	(Electric Dreams)
7	(9)	One Simulator	(Mastertronic)
8	(5)	Biggles	(Mirrorsoft)
9	(8)	Bump Set Spike	(Mastertronic)
10	(6)	Saboteur	(Durell)

Atari

1	(1)	Kik Start	(Mastertronic)
2	(2)	Vegas Jackpot	(Mastertronic)
3	(7)	Shamus	(Americana)
4	(5)	New York City	(Americana)
5	(3)	Last V8	(Mastertronic)
6	RE	Gilles Follies	(Americana)
7	(8)	Action Biker	(Mastertronic)
8	(4)	One Man & his Droid	(Mirrorsoft)
9	(13)	Arcade Classics	(Datasoft)
10	(9)	Scooter	(Americana)

BBC

1	(1)	Commando	(Elite)
2	(6)	Winter Olympics	(Tynesoft)
3	(3)	Tennis	(Bugbyte)
4	(2)	Bruce Lee	(US Gold)
5	(–)	Speech	(Superior)
6	(–)	Citadel	(Superior)
7	(7)	Comp Hits 10	(Beau Jolly)
8	(–)	Karate Combat	(Superior)
9	(–)	Cosmic Battle Zone	(US Gold)
10	(8)	Galactic Patrol	(Mastertronic)

Spectrum

1	(3)	Knight Tyme	(Mastertronic)
2	(1)	World Cup Carnival	(US Gold)
3	(6)	Ninja Master	(Firebird)
4	(2)	Batman	(Ocean)
5	(–)	Pentagram	(Ultimate)
6	(7)	Heavy On The Magick	(Gargoyle)
7	(5)	Green Beret	(Imagine)
8	(4)	Rock N Wrestle	(Mel House)
9	(10)	Quazatron	(Hewson)
10	(8)	Fireman	(Mastertronic)

NEXT WEEK
SPECIAL SUPPLEMENT

We'll have another of our popular supplements next week this time dealing with the potential of your printer

● Laser printers – a survey

● Enchance your output by experimenting with different fonts – we look at the products available

Desk-top publishing – a new use for the micro currently in vogue

● Full buyers guide to printers on the market

PLUS

● Language series

Kenn Garroch introduces Logo one of the most popular 'alternative' languages If you want to know about turtles and why Logo is supposed to be both fun and educational, read on

● Hardware

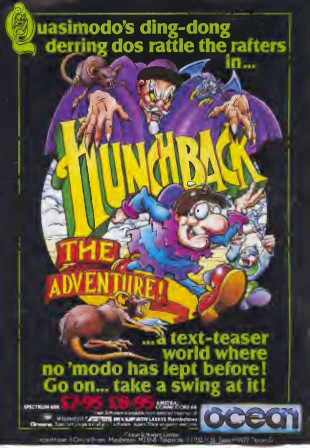
The sluggishness of Commodore s 1541 disc drive is well-known but until now there s been nothing you can do about it Chris Jenkins investigates a speed-up device for the 1541

The Hackers






INCENTIVE
THE GRAPHIC
ADVENTURE
CREATOR


Quasimodo's ding-dong
derring dos rattle the rafters
in...
HUNCHBACK
THE
ADVENTURE!
...a text-teaser
world where
no 'modo has lept before!
Go on... take a swing at it!
SPECTRUM 48K £7·95 £8·95 AMSTRAD COMMODORE 64
ocean
Ocean Software Limited